

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

SCREENING SITE INSPECTION REPORT

FOR

OLD MISHAWAKA DUMP

MISHAWAKA, INDIANA

U.S. EPA ID: IND982073215

EPA Region 5 Records Ctr.



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NOV 17 1989  
Pre-remedial

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

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Signature Page  
for  
Old Mishawaka Dump  
Mishawaka, Indiana

U.S.EPA ID: IND982073215

Prepared by:

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Date:

8/21/89

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Date:

29 September 1989

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Date:

Sept. 29, 1989

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Approved by:

Colleen Hunt

Date:

10/19/90

EPA Project Manager  
U.S. EPA, Region V

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## Section I

### Introduction

The Site Investigation Section of the Indiana Department of Environmental Management (IDEM) was approved by the United States Environmental Protection Agency (U.S.EPA) to conduct a Screening Site Inspection (SSI) of the Old Mishawaka Dump, located in Mishawaka Indiana, St. Joseph County.

The site was identified as a former dump in a groundwater quality assessment report issued by the Michiana Area Council of Governments (MACOG) in 1980. The site's inclusion in MACOG's report led to its eventual placement on the Comprehensive Environmental Response, Compensation and Liability Inventory System (CERCLIS) list.

A Preliminary Assessment (PA) was completed by Mr. Tim Heffernan of the IDEM in April, 1988, following the incidental discovery of a number of buried 55-gallon drums on-site. The site received a high priority assessment due to the potential for contaminants originating at the site to migrate to nearby municipal wells.

The SSI was conducted by State Personnel on May 10, 1988. The SSI included the collection of soil, surface water and municipal well samples and a magnetometer survey of the site.

An excavation pit where nine (9) to thirteen (13) drums were uncovered provided duplicate samples of soil and standing water. The three (3) remaining samples were obtained from two (2) municipal wells located approximately 1,500 feet southeast of the site.

Information contained within this report will be used to evaluate the site under the Revised Hazard Ranking System Model for possible inclusion on the National Priorities List (NPL) of hazardous waste sites.

The purposes of an SSI have been stated by U.S. EPA in a directive outlining pre-remedial strategies.

The directive states:

All sites will receive a screening SI to 1) collect additional data beyond the PA to enable a more refined preliminary HRS (Hazard Ranking System) score, 2) establish priorities among sites most likely to qualify for the NPL (National Priorities List), and 3) identify the most critical data requirements for the listing SI step. A screening SI will not have rigorous data quality objectives (DQOs). Based on the refined preliminary HRS score and other technical judgement factors, the site will then either be designated as NFRAP (no further remedial action planned), or carried forward as an NPL listing candidate. A listing SI will not automatically be done on these sites, however. First, they will go through a management evaluation to determine whether they can be addressed by another authority such as RCRA (Resource Conservation and Recovery Act).... Sites that are designated NFRAP or deferred to other statutes are not candidates for a listing SI.

The listing SI will address all the data requirements of the revised HRS using field screening and NPL level DQOs. It may also provide needed data in a format to support remedial investigation work plan development. Only sites that appear to score high enough for listing and that have not been deferred to another authority will receive a listing SI.

## Section II

### Site Background

#### 2.1 Site Description

The Old Mishawaka Dump is located just south of the 1100 block of 5th Street in Mishawaka, Indiana. Dearborn Fabricating Company owns the site and occupies a small portion of the property along 5th Street. The remainder of the approximately 20 acres is leased to the City of Mishawaka which uses the property as a separation/disposal station, known as the Mishawaka Recycling Center, for materials collected during an annual spring clean-up. For a period of two (2) weeks each spring the city provides citizens with a collection service for discarded household items, wood, brush and other debris. Materials are then sorted by type for eventual recycling or disposal. Brush and wood is burned on-site in large pits.

The site is largely devoid of vegetation with several large mounds of dirt and scrap metal near the center of the property. With the exception of these mounds, the topography is flat across the site. A pond and a scrap yard are located immediately south of the site. The immediate focus of concern for potential groundwater contamination is a small municipal well field located approximately 1,500 feet southeast of the Mishawaka Recycling Center in a municipal park. Other land use in the immediate vicinity of the site is mixed residential, retail and industrial. The St. Joseph River, located approximately one-half (1/2) mile northwest of the former dump, is the nearest usable surface water source in the area. Recreation is the primary use of the St. Joseph River, since all municipal water is obtained from groundwater.

## 2.2 Site History

With regard to waste disposal, the history of the Old Mishawaka Dump apparently begins in the mid 1940's. The property had previously been used for mining sand and gravel which left one (1), and possibly several, water-filled gravel pit(s) on-site. A 1951 aerial photograph identified at least three (3) significant bodies of water at the site. However, extensive filling of the area, already well underway by 1951, may have created several smaller ponds from one larger gravel pit. Wastes disposed of on-site were dumped directly into water. Local residents allegedly complained about odors produced by the release of hydrogen sulfide gas from the water.

Responsibility for operation of the site appears to have been split between the City of Mishawaka and Uniroyal Plastics Company, Inc. Internal Uniroyal memoranda from the late 1940's and early 1950's indicate that the City utilized part of the site while Uniroyal used a separate section of the property referred to as the "Ball-Band Dump".

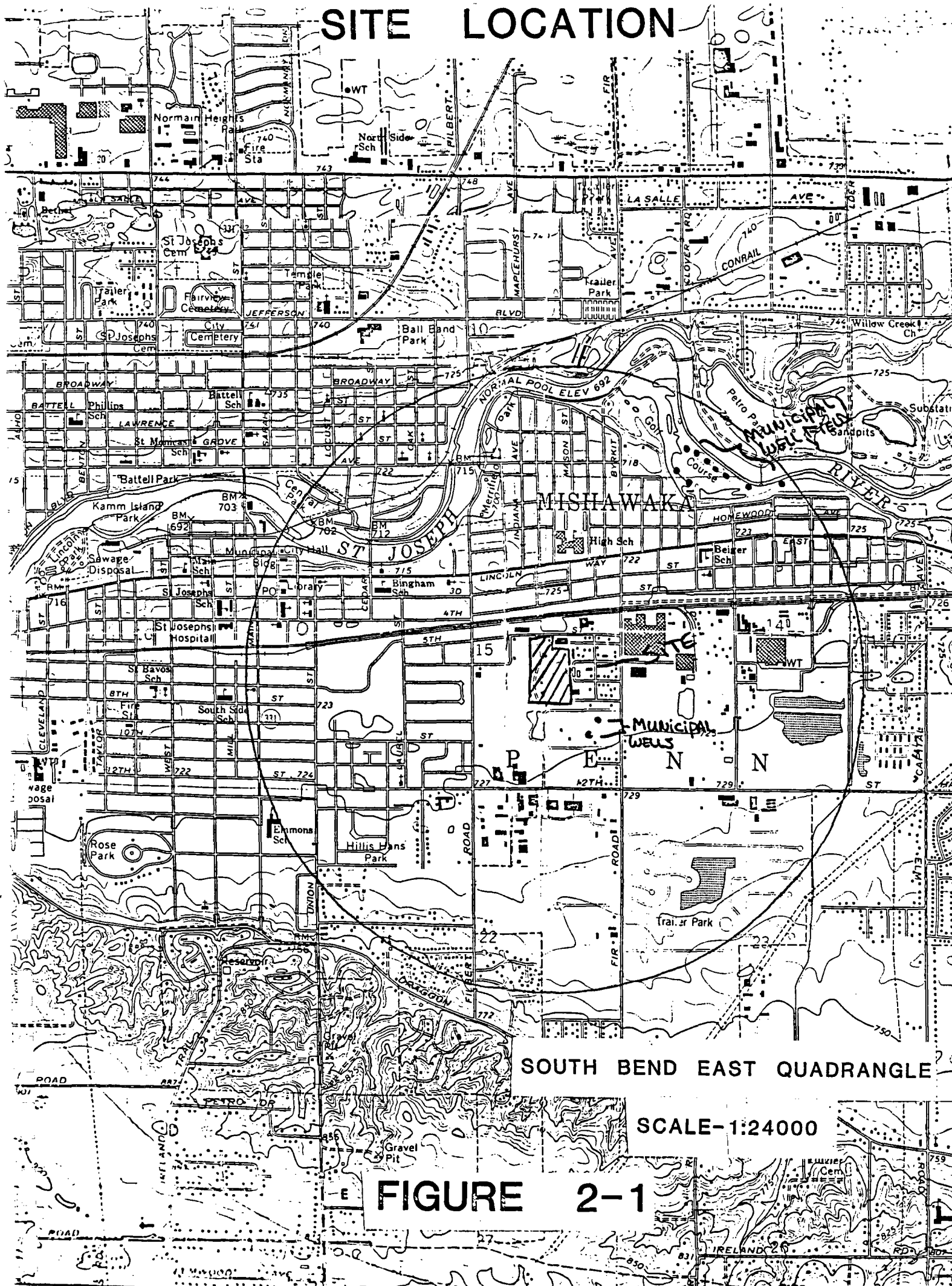
Those same internal memoranda infer that Uniroyal began dumping at the site in 1946 and continued into 1952. Mishawaka Fire Chief Mike Watson, however, believed that Uniroyal used the site until 1954, when a second Uniroyal dump came into operation. This second dump, the Douglas Road Uniroyal Landfill (ID #: IND980607881) is currently on the National Priorities List (NPL) of hazardous waste sites.

According to the Penn Township Assessor's records, a Mr. Leo Reider owned the property in question during the time that Uniroyal and the City jointly operated the site. Ownership changed in 1955 when Dearborn Fabricating, the current owner, purchased the property. The City's lease apparently remained in effect through this change in ownership and remains in effect today.

IDEM first became aware of a potentially serious problem at the site in March, 1988, when Mishawaka Fire Chief Mike Watson reported the discovery of buried drums on-site. Nine (9) to thirteen (13) drums were uncovered during excavation of a new burn pit. Two (2) of the drums were inadvertently ruptured by a backhoe, releasing a vaporous cloud which reportedly caused throat and nasal burns in the backhoe operator. A third drum was removed from the pit and sampled by IDEM on March 23, 1988. Analytical results were inconclusive, however, the semi-solid material was determined to be non-hazardous.



# SITE LOCATION



## Section III

### Screening Site Inspection Procedures and Field Observations

#### 3.1 Introduction

This section outlines the procedures and observations of the Old Mishawaka Dump Screening Site Inspection. The U.S. EPA Potential Hazardous Waste Site Inspection Report Form (2070-13) for this site is provided in Appendix B.

#### 3.2 Site Representative Interview

On March 23, 1988, while investigating the discovery of buried drums at the Old Mishawaka Dump, Staff interviewed two (2) individuals associated with ownership or operation of the site. Mishawaka Fire Chief Mike Watson, who oversees the burning of brush and other materials at the Mishawaka Recycling Center, and Mr. Larry Dunville, owner of Dearborn Fabricating and the property in question, were interviewed.

Chief Watson provided a description of the City's current activities at the site and described the recent discovery of buried 55-gallon drums on-site. He also notified Staff of Uniroyal's possible involvement at the site and provided an estimate of the time period during which the dump was active.

Mr. Larry Dunville had no specific information regarding operation of the dump, however, he was able to clarify the ownership history of the site back to the early 1950's. Dearborn purchased the property and the City's lease on

the property in 1955 from a private individual, whose name he could not recall. The City maintained its lease on the property following the transaction.

### 3.3 Reconnaissance Inspection

Upon arrival at the site on May 10, 1988, IDEM's field team walked the Old Mishawaka Dump property and established on-site sample locations for both water and soils. Staff limited its selection of on-site sample points to the pit where drums had recently been uncovered. The approximately ten (10) foot deep pit provided the field team with access to exposed groundwater and soils beneath the fill that had evidently been applied when landfilling was completed in the 1950's. Additional sample points chosen were two (2) municipal wells located approximately 1,500 feet southeast of the site and a small pond just south of the former dump.

### 3.4 Inspection Observations

Inspection of the 17.5 acre site revealed it to be devoid of vegetation except for small trees surrounding the perimeter of the property. Several mounds of dirt were present along with a large mound of scrap metal and old appliances that had been collected during the City's spring clean-up. The pit containing the uncovered drums was located in the northeast quarter of the site. Several other burn pits were located near the center of the property.

Inspection of the pit revealed two (2) partially crushed 55-gallon drums lying in shallow water at the bottom of the pit. Seven (7) to eleven (11) additional drums were reportedly observed in the pit during the original

excavation however they were not visible during the SSI due to turbid standing water in the pit. Dirt from the sides of the excavation may also have fallen back into the pit covering the remaining drums.

A small pond is located immediately south of the site on property owned by Mr. Al Zeiller. According to Mr. Zeiller this pond was once connected to one large gravel pit on the Old Mishawaka Dump property. He also recalled the gravel pit having a maximum depth of 110 feet. These assertions regarding the number and depth of gravel pits on-site seem to contradict internal memoranda provided by Uniroyal. However, given the apparently rapid rate at which the gravel pit(s) were filled, the contradictions may simply reflect different conditions at the site at different points in time.

### 3.5 Sample Collection

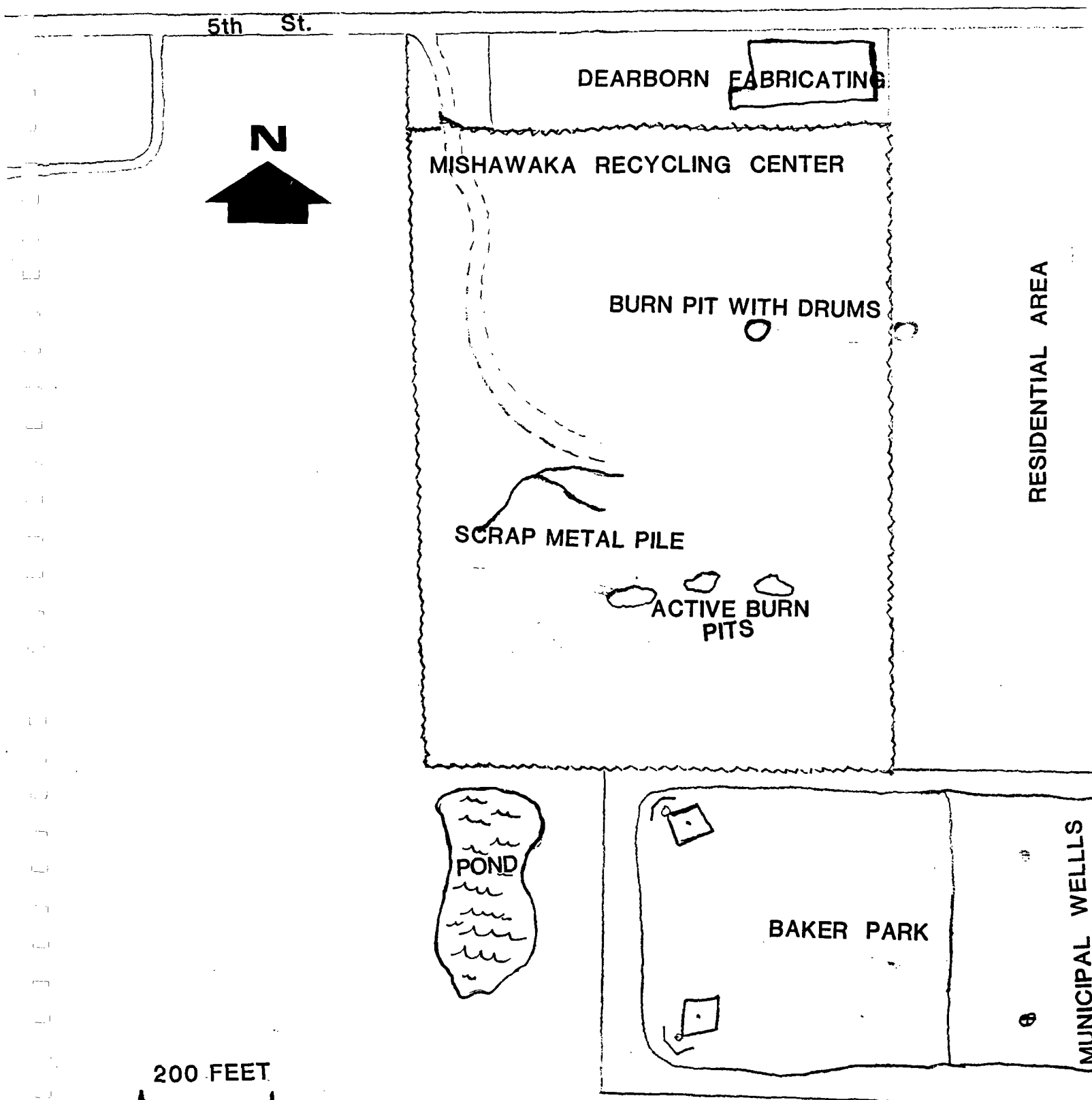
Eight (8) total samples including duplicates and a trip blank were collected in conjunction with the Old Mishawaka Dump SSI. Duplicate samples C3373 and C3374 were collected from the drum pit just above the waterline. Samples C3375 and C3376 were samples of exposed groundwater standing in the bottom of the pit. The field team felt that these sample locations offered the best opportunity to determine the contents of the drums inadvertently ruptured two (2) months prior to sampling. Additional soil samples appeared unnecessary because of the thick cover of soil overlying landfilled wastes. The drums in the pit were at a depth of approximately ten (10) feet. The two (2) municipal wells located southeast of the former dump provided samples C3377 and C3378. Mishawaka Municipal Utilities designates the two (2) wells Baker 7 and Byrkit 6 respectively. Both wells are located in Baker Park less than 1500 feet southeast of the former dump. The well logs for both wells are provided in Appendix F.

Sample C3380 was collected from a pond located just south of the Old Mishawaka Dump. The pond may have been contiguous with gravel pits on-site prior to the landfilling of the 1940's and 1950's. The pond provided a means to determine whether contaminants possibly present in groundwater are migrating southward from the site. Sample C3379 was a trip blank obtained from EIS Laboratories, South Bend, Indiana.

The IDEM field team was unable to locate any wells to the north, northwest or west of the site and consequently no samples were collected. No soil background sample was collected because Staff had no way to obtain a background sample at sufficient depth to provide a realistic basis for comparison with soil samples C3373 and C3374.

RR TRACKS

# SITE FEATURES



200 FEET  
APPROXIMATE SCALE

FIGURE 3-1

RR TRACKS

# SAMPLE LOCATIONS

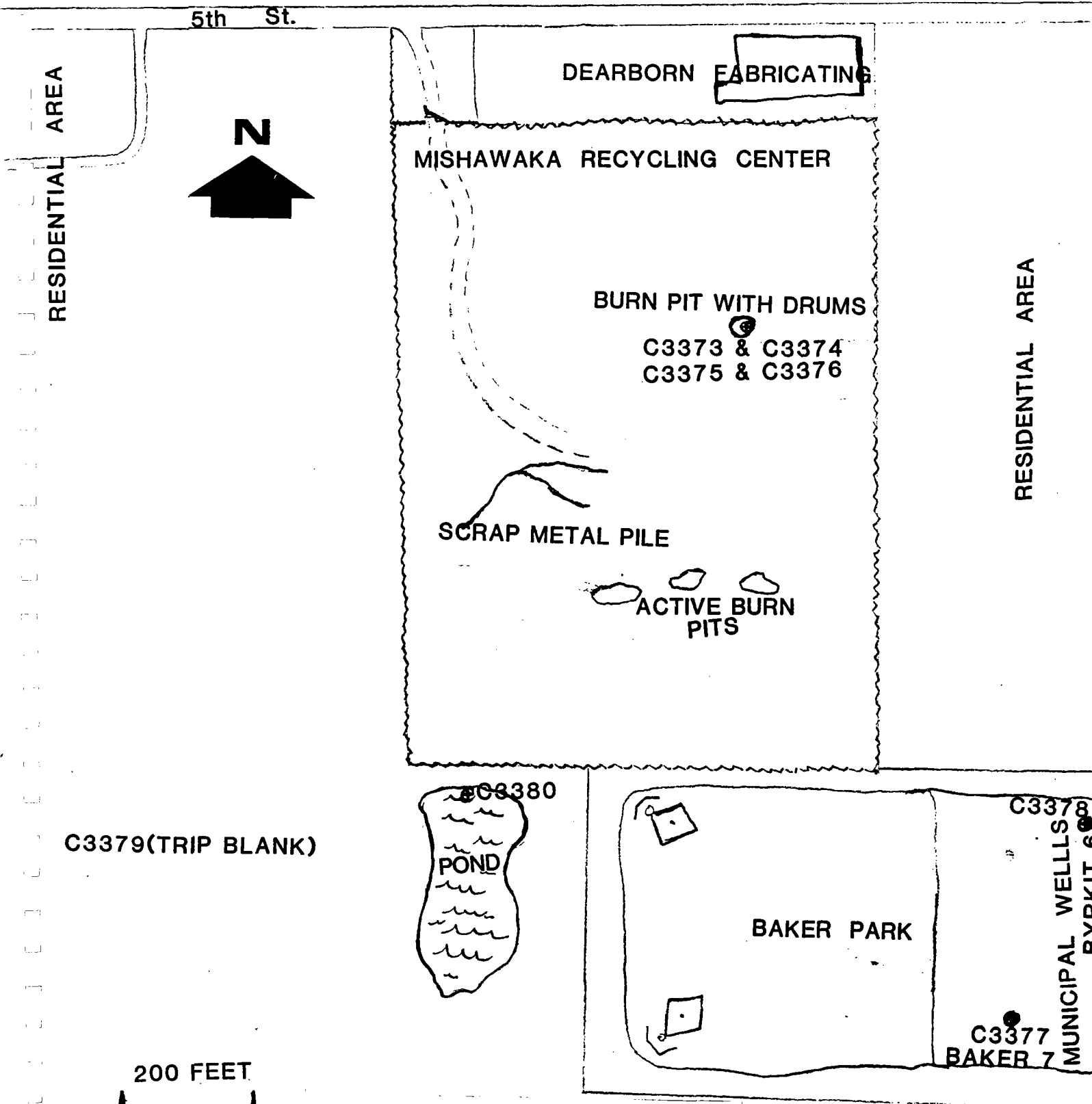


FIGURE 3-2

## Section IV

### Analytical Results

#### 4.1 Introduction

This section includes the results of the chemical analysis of soil, surface water, municipal well water, and exposed groundwater samples collected during the Old Mishawaka Dump SSI, May 10, 1988. All samples were analyzed for the presence of volatile and semi-volatile organic compounds, routine metals, PCBs and pesticides.

#### 4.2 Sample Analysis

Chemical analysis revealed no significant concentrations of semi-volatile organic compounds, heavy metals or pesticides in any of the samples. Low concentrations of a number of volatile organic compounds were detected in subsurface soil samples C3373 and C3374. Concentrations ranged from less than one (1) part per million (ppm) of Trichloroethylene and 1,2-Dichloropropane to seven (7) ppm of Methyl-ethyl Ketone. None of the volatile organic concentrations detected in subsurface soils appear to be cause for concern at this time.

Exposed groundwater samples (C3375 & C3376) collected from the bottom of the drum pit showed 1,2-Dichloropropane concentrations of 9.7 and 9.5 parts per billion respectively. These concentrations, while relatively low, may become a concern should similar contaminant concentrations migrate to municipal or residential wells. In addition to 1,2-Dichloropropane duplicate



samples C3375 and C3376 showed polychlorinated biphenyl contamination at an average concentration of 260ng per liter (.26 ppb). This corresponds to approximately 250 times the  $10^{-5}$  cancer risk factor and should be considered a cause for concern. No PCBs were detected in soil samples collected approximately six (6) inches above the water table indicating that PCBs detected in groundwater may have originated below the water table.

For a complete summary of sample results see appendix D.

## DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

INDIANAPOLIS

OFFICE MEMORANDUM

DATE: August 9, 1988

THRU: ~~Gregory A. Busch~~ *pc 12/27/88*  
Jack C. Corpuz  
Harry E. Atkinson *10/12/89*

TO: Tim Heffernan  
Site Investigation Section

FROM: Dan Raveed *CR 12/27/88*  
Chemical Evaluation Section

SUBJECT: Review of Laboratory Results for Old Mishawaka Dump,  
St. Joseph County  
Collected on May 10, 1988; Samples C3373-C3380  
Analyzed by EMS Laboratories and EIS Environmental Engineers

I have reviewed the attached laboratory results and have determined that they are acceptable for use. These results have been evaluated for the quality criteria contained in the Indiana Quality Assurance Project Plan (QAPP). Any exceptions to the acceptance of this data will be identified in this memorandum and should remain attached to the original results.

Field duplicate samples are used to establish the representativeness of the sampling (i.e., sampling error and/or sample homogeneity). The field duplicates compare well.

No significant concentrations of heavy metals, semi-volatile organics, or volatile organic compounds were detected. The ditchwater duplicate samples (C3375 and C3376) contained a small amount of 1,2-dichloropropane. They averaged a total of 260 ng per liter of the PCBs, Aroclor 1254 and Aroclor 1260. This is about 250 times the  $10^{-5}$  cancer risk factor, a cause for concern.

DR/ram

Attachments



REPORTED  
- 2 JUNE 88  
SAMPLED  
10 MAY 88  
CONTROL  
NUMBERS

SAMPLE  
TYPE SITE

SURROGATES

DETECTED

VOLATILES  
BY EIMS  
DATE ANALYZED  
1,2-DICHLORO  
PROPANE  
ACETONE  
CHLOROFORM

SEMI-VOLATILES  
ANALYZED BY EIMS

SURROGATES

DETECTED

DATE ANALYZED

EIMS IDEAL

%R ?

%R ?

DETECTION LIMIT

PPM PPM

102536  
C3373 SOIL \*

EXC. ND 26 MAY

102537  
C3374 SOIL \*

FAIR ND 5/26

102538  
C3375 DITCH-WATER \*

102539  
C3376 DITCH-WATER \*

102540  
C3377 MUNICIPAL WELL WATER

GOOD ND 5/17

102541  
C3378 MUN. WELL

VERY GOOD ND 5/17

102542  
C3379 TRIP BLANK #

VERY GOOD ND 5/17

102543  
C3380 POND WATER

GOOD ND 5/17

SOIL BLANK

EXC. ND 5/26

DUPL. MATRIX

? OK 5/27

SPIKE

WATER BLANK 17 MAY

GOOD ND 5/17

\* CONFIRMED BY GC/MS

\* FIELD DUPLICATE

# TRIP BLANK

OLD MISHNICKA DUMP

ST. JOSEPH COUNTY

COMPLETED JUL 25 1988

Allen R. Reed

REPORTED  
2 JUN 88  
SAMPLED  
MAY 88

# HEAVY METALS, TOTAL

ANALYZED BY EIB

ANALYZED BY EMS

CONTROL

As Ba Cd Cr Pb Hg Se Ag Ni

DETECTION  
LEVEL

ARCOLOR  
1254

ARCOLOR  
1260

PCB  
S

SITE

TYPE ID

IS  
UNITS  
DETECTION LIMITS

ppm ppm ppm ppm ppm ppm ppm ppm ppm

CONTRACT

0.01  
0.5  
ppm

0.0008  
0.00008  
ppm

0.0008  
ppm

L 441  
C3373

0.51 200 0.91 17 107 0.15 <0.017 <0.66 10

94 ND

SOIL \*

L 442  
C3374

0.43 328 0.94 13 225 0.01 <0.15 <0.62 13

93 ND

SOIL \*

L 443  
C3375

<0.01 <0.5 0.04 0.01 0.8 0.002 <0.005 <0.005 0.016

0.0008

0.00008

98

DITCH WATER \*

L 444  
C3376

ND ND 0.04 0.009 1.21 0.0003 ND ND 0.017

0.0008

0.00008

102

DITCH WATER \*

L 445  
C3377

ND ND ND ND ND ND ND ND ND

101 ND

MUNICIPAL WELL, BAKER \*

L 446  
C3378

ND ND ND ND 2053 ND ND ND ND

96 ND

MUNICIPAL WELL

L 447  
C3379

ND ND ND ND ND ND ND ND ND

95 ND

TRIP BLANK #

L 448  
C3380

ND ND ND ND ND ND ND ND ND

95 ND

POND WATER

# TRIP BLANK

\* FIELD DUPLICATE

040 MISHKAWKA DULAK  
ST. JOSEPH COUNTY

COMPLETED JUL 25 1988

Alan Rance

## Section V

### Migration Pathways

#### 5.1 Introduction

This section discusses potential migration pathways for contaminants emanating from the Old Mishawaka Dump. Potential contaminant migration through groundwater, surface water and air is discussed as well as the potential for human and environmental exposure through the fire and explosion and direct contact routes.

#### 5.2 Groundwater

The Old Mishawaka Dump SSI focused on characterizing the condition of groundwater in the vicinity of the site. The permeability of soils, wastes disposal practices, and depth to groundwater in the area are all conducive to groundwater contamination. In the vicinity of the site, a moderately thick deposit of clay till separates an upper sand and gravel unit from a lower, more productive aquifer. This clay unit appears, however, to be of limited areal extent and should therefore not be considered a discontinuity between the upper and lower water bearing units. The aquifer of concern, in this instance, should be classified as unconfined. The water table therefore represents the uppermost aquifer boundary. The two (2) municipal wells sampled showed no detectable contamination however both of these wells appear to be upgradient of the former dump. IDEM was unable to locate any nearby downgradient wells prior to conducting the SSI.

Samples C3375 and C3376, collected from standing water in the drum pit showed low level PCB and 1,2-dichloropropane contamination. The pit in question was deep enough to have reached the local water table. Consequently, the aforementioned samples are probably more representative of shallow groundwater conditions than surface water. Despite the relatively low level contamination detected and the absence of downgradient samples, several factors create a strong potential for significant groundwater contamination.

The disposal of wastes directly into water and the high permeability of local soils dramatically increase the chances for off-site migration should hazardous materials be present in significant quantity. The discovery of as many as thirteen (13) buried drums at the site raises questions about the nature and quantity of materials disposed of at the former landfill. An investigation of records concerning a second Uniroyal Dump currently on the NPL may provide some basis for estimating the types and quantity of materials disposed of at the site.

U.S. EPA estimates that during the period 1954 - 1971 Uniroyal disposed of the equivalent of 6000 barrels of waste solvents at the Douglas Road Uniroyal Landfill. Assuming a slightly lower disposal rate at the Old Mishawaka Dump for the period 1946 - 1954, we can arrive at a quantity estimate of 2500 barrel equivalents or approximately 125,000 gallons. Whether disposal actually occurred in drums remains a point of contention between EPA and Uniroyal at the Douglas Road Uniroyal Landfill and remains a question at the Old Mishawaka Dump.

A magnetometer survey was conducted by the IDEM field team as part of the SSI to better evaluate the possibility of large scale drum burial. Results were inconclusive and may have been influenced by a mound of scrap metal

several hundred feet away or other factors. However, magnetometer readings did show large variations across the site as compared with a nearby background survey. While the precise cause for these magnetic anomalies is not known, the possibility of large scale drum burial cannot be ruled out. Clearly the discovery of a number of buried drums in 1988 lends credence to such a possibility.

Contaminants emanating from the Old Mishawaka Dump would migrate to the northwest, toward the St. Joseph River. However, local disturbances in groundwater flow, may have altered the expected gradient. Wheelabrator-Frye Incorporated located approximately 1500 feet east of the site withdraws large quantities of groundwater for industrial use. The two (2) municipal wells that were sampled in conjunction with this SSI also pump large quantities of groundwater. The total permitted withdrawal capacity for both facilities exceeds 3.5 million gallons per day, a volume sufficient to disrupt the expected pattern of groundwater flow for a considerable radius around each of the respective wells. An accurate evaluation of the potential for groundwater contamination will require the installation of monitoring wells at this site. The potentially affected population exceeds 50,000.

### 5.3 Surface Water

The St. Joseph River is located approximately 2,000 feet northwest of the site and the surface gradient slopes very gently from the site to the river. The site itself is rather flat and little surface runoff is expected to reach the river. Fill material appears to have been applied to the site at some point in the past thus accounting for the flat surface topography. Most of



the surface runoff that migrates off-site probably ends up in a small pond located adjacent to the southernmost edge of the property. Sample C3380, collected from the pond, showed a chloroform concentration of 1.1 part per million (mg/l). Chloroform is a common laboratory contaminant however, it appeared in no other water samples and therefore appears to be an actual find. The detected concentration is slightly below the permissible chronic concentration for the protection of aquatic life (1.24 mg/l). The pond may receive some recreational fishing or swimming since it is accessible from an adjacent municipal park through a hole in a fence.

The most likely route for extensive contamination of surface water is through groundwater discharge to the St. Joseph River. Recreational exposure would be the primary route of concern should contaminants from the Old Mishawaka Dump reach the river.

#### 5.4 Air

No potential for a significant release of contaminants to air was noted during the Old Mishawaka Dump SSI. Any hazardous materials present on-site would be buried, lessening the possibility of a large scale release to the air. An HNU photoionization detector failed to reveal any elevated concentrations of volatile organic compounds in ambient air on-site.

The burning of brush and wood in pits at the site creates the greatest potential for a significant release of hazardous materials to the air. The burning normally takes place for two (2) weeks each spring however the State requested that burning activities be halted until the situation at the Recycling Center is clarified.

## 5.5 Fire and Explosion

As discussed in Section 5.4, brush and wood are burnt in large pits at the Mishawaka Recycling Center (Old Mishawaka Dump) for a period of two (2) weeks each spring. During excavation of a new burn pit in 1988 approximately 13 buried drums were discovered. While the contents of those drums remain unknown, the manner in which the materials escaped from two (2) ruptured drums and the absence of large concentrations of the material in samples collected near the drums six (6) to seven (7) weeks later indicates a highly volatile nature. This conclusion is also supported by an internal Uniroyal memorandum which describes conditions at the dump in 1951;...."despite our efforts through the City Fire Department to control fires at the city dump, their side is continually blazing, and as city dumping approaches our dumping ground the probability of a fire will increase alarmingly.....it must be emphasized again that as the city approaches our side we can expect fires since a considerable amount of our material is highly flammable."

This memo clearly indicates a history of fires at the former dump. While no fire related problems have been reported in recent years the apparent presence of "highly flammable" wastes in the subsurface creates the possibility of a serious fire or explosion should burning at the site be allowed to resume.

## 5.6 Direct Contact

Access to the Mishawaka Recycling Center is restricted by a fence that surrounds the perimeter of the site. A single access gate is provided from 5th Street. Given the apparent burial of wastes on-site and restricted access

the potential for local residents to come into direct contact with hazardous materials appears minimal. Workers at the Mishawaka Recycling Center however may come into contact with hazardous wastes during excavation activities. Such exposure has already been documented in March, 1988 during the excavation of a burn pit.

## SECTION VI

### REFERENCES

- 1.) EPA Potential Hazardous Waste Site Preliminary Assessment Form  
(EPA Form 2070-12 (7-81) for the Old Mishawaka Dump, Mishawaka, Indiana.
- 2.) Personal Communication, Mr. Mike Watson, Mishawaka Fire Chief,  
600 East 3rd Steet, Mishawaka, Indiana.
- 3.) Personal Communication, Mr. Larry Dunville, owner of Dearborn Fabricating  
Company, and the site in question, 1131 5th Street, Mishawaka, Indiana.
- 4.) Personal Communication, Mr. Jim Crook, Mishawaka Municipal Utilities,  
126 N. Church Street, Mishawaka, Indiana.
- 5.) Water Utilities, information obtained from Mr. Denny Merritt, General  
Foreman, Water Utility, 126 N. Church Street, Mishawaka, Indiana.
- 6.) Geologic Assessment, Mr. Billy Giles, Geologist, Indiana Department of  
Environment Management (IDEM), Indianapolis, Indiana.
- 7.) Response to an information request sent to Mr. Richard Carpenter of  
Uniroyal was received from Ms. Susan Shumway, Shumway and Merle, Attorneys  
at Law, 2425 Post Road, Suite 205, Southport, CT.
- 8.) Indiana Department of Natural Resources, Division of Water Resources, Well  
Logs, obtained by Mr. Billy Giles, IDEM.

APPENDIX A

SITE FOUR (4) MILE RADIUS MAP

APPENDIX A  
SITE FOUR (4) MILE RADIUS MAP

A-1

# SDMS US EPA Region V

## *Imagery Insert Form*

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OVERSIZE MAP – 4 MILE RADIUS MAP

Document is available at the EPA Region 5 Records Center.

**Specify Type of Document(s) / Comments:**

APPENDIX B

U.S. EPA FORM 2070-13



APPENDIX B

U.S. EPA FORM 2070-13

B-1



POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION  
01 STATE 02 SITE NUMBER  
IND 982073215

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site) Old Mishawaka Dump		02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER 1131 East Fifth Street			
03 CITY Mishawaka	04 STATE IN	05 ZIP CODE 46544	06 COUNTY St. Joseph	07 COUNTY CODE 141	08 CONG DIST 03
09 COORDINATES LATITUDE 41° 39' 10" N LONGITUDE 086° 09' 50" W		10 TYPE OF OWNERSHIP (Check one) <input checked="" type="checkbox"/> A. PRIVATE <input type="checkbox"/> B. FEDERAL <input type="checkbox"/> C. STATE <input type="checkbox"/> D. COUNTY <input type="checkbox"/> E. MUNICIPAL <input type="checkbox"/> F. OTHER <input type="checkbox"/> G. UNKNOWN			

III. INSPECTION INFORMATION

01 DATE OF INSPECTION 05/10/88 MONTH DAY YEAR	02 SITE STATUS <input type="checkbox"/> ACTIVE <input type="checkbox"/> INACTIVE	03 YEARS OF OPERATION BEGINNING YEAR 1946 ENDING YEAR 1954 alledged UNKNOWN			
04 AGENCY PERFORMING INSPECTION (Check all that apply) <input type="checkbox"/> A. EPA <input type="checkbox"/> B. EPA CONTRACTOR (Name of firm) <input type="checkbox"/> C. MUNICIPAL <input type="checkbox"/> D. MUNICIPAL CONTRACTOR (Name of firm) <input checked="" type="checkbox"/> E. STATE <input type="checkbox"/> F. STATE CONTRACTOR (Name of firm) <input type="checkbox"/> G. OTHER (Specify)					
05 CHIEF INSPECTOR Tim Heffernan		06 TITLE Environmental Scientist III		07 ORGANIZATION IDEM	08 TELEPHONE NO. (317) 232-8902
09 OTHER INSPECTORS Harry E. Atkinson		10 TITLE Section Chief, Site Investigations		11 ORGANIZATION IDEM	12 TELEPHONE NO. (317) 232-8928
Bruce Oertel		Environmental Scientist II		IDEM	(317) 232-7130
					( )
					( )
					( )
13 SITE REPRESENTATIVES INTERVIEWED Mike Watson		14 TITLE Fire Chief	15 ADDRESS 600 E. 3rd St. Mishawaka		16 TELEPHONE NO. (219) 258-1673
Larry Danville		owner-Dearborn	Fabricating 1131 East Fifth		(219) 259-2444
					( )
					( )
					( )
					( )
					( )
					( )
17 ACCESS GAINED BY (Check one) <input checked="" type="checkbox"/> PERMISSION <input type="checkbox"/> WARRANT		18 TIME OF INSPECTION 12:45-3:00 p.m.		19 WEATHER CONDITIONS overcast	
IV. INFORMATION AVAILABLE FROM					
01 CONTACT Harry E. Atkinson		02 OF (Agency/Organization) IDEM/OSHW			03 TELEPHONE NO. (317) 232-8928
04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM Tim Heffernan		05 AGENCY IDEM	06 ORGANIZATION OSHW	07 TELEPHONE NO. 317-232-8902	08 DATE 05/10/88 MONTH DAY YEAR



<b>01 PHYSICAL STATES</b> (Check all that apply) <input type="checkbox"/> A. SOLID <input type="checkbox"/> B. POWDER, FINES <input type="checkbox"/> C. SLUDGE <input type="checkbox"/> D. OTHER <u>unknown</u> <small>(Specify)</small>	<b>02 WASTE QUANTITY AT SITE</b> <small>(Measures of waste quantities must be independent)</small> <input type="checkbox"/> E. SLURRY <input checked="" type="checkbox"/> F. LIQUID <input type="checkbox"/> G. GAS TONS _____ CUBIC YARDS _____ NO. OF DRUMS <u>2500 estimated</u>	<b>03 WASTE CHARACTERISTICS</b> (Check all that apply) <input checked="" type="checkbox"/> A. TOXIC <input type="checkbox"/> B. CORROSIVE <input type="checkbox"/> C. RADIOACTIVE <input checked="" type="checkbox"/> D. PERSISTENT <input type="checkbox"/> E. SOLUBLE <input type="checkbox"/> F. INFECTIOUS <input checked="" type="checkbox"/> G. FLAMMABLE <input checked="" type="checkbox"/> H. IGNITABLE <input checked="" type="checkbox"/> I. HIGHLY VOLATILE <input type="checkbox"/> J. EXPLOSIVE <input type="checkbox"/> K. REACTIVE <input type="checkbox"/> L. INCOMPATIBLE <input type="checkbox"/> M. NOT APPLICABLE
--	--	---

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS	unknown		
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

[illegible]

CATEGORY	.01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

[illegible]



POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT

PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

1. IDENTIFICATION

01 STATE 02 SITE NUMBER  
IND 982073215

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION 02 ☐ OBSERVED (DATE: \_\_\_\_\_) ☒ POTENTIAL ☐ ALLEGED  
03 POPULATION POTENTIALLY AFFECTED: 50,000 04 NARRATIVE DESCRIPTION

The permeability of soils, waste disposal practices and depth to groundwater are all conducive to groundwater contamination. Municipal wells are located within 1,500 ft. of the site.

01 ☒ B. SURFACE WATER CONTAMINATION 02 ☐ OBSERVED (DATE: \_\_\_\_\_) ☒ POTENTIAL ☐ ALLEGED  
03 POPULATION POTENTIALLY AFFECTED: unknown 04 NARRATIVE DESCRIPTION

The St. Joseph River is located within  $\frac{1}{2}$  mile of the site, however, little surface run-off would be expected to reach the river. Groundwater discharge appears to be the most likely route for significant surface water contamination. A pond just south of the site showed a chloroform concentration of 1.1 ppm.

01 ☒ C. CONTAMINATION OF AIR 02 ☐ OBSERVED (DATE: \_\_\_\_\_) ☒ POTENTIAL ☐ ALLEGED  
03 POPULATION POTENTIALLY AFFECTED: \_\_\_\_\_ 04 NARRATIVE DESCRIPTION

No recent air contamination has been reported. Hnu photoionizer failed to detect ambient concentrations of volatiles above background levels.

01 ☒ D. FIRE/EXPLOSIVE CONDITIONS 02 ☐ OBSERVED (DATE: \_\_\_\_\_) ☒ POTENTIAL ☐ ALLEGED  
03 POPULATION POTENTIALLY AFFECTED: \_\_\_\_\_ 04 NARRATIVE DESCRIPTION

The site had a history of fires while active. Controlled burning in pits takes place each spring and there is/was apparently highly flammable wastes in the sub-surface.

01 ☒ E. DIRECT CONTACT 02 ☐ OBSERVED (DATE: \_\_\_\_\_) ☒ POTENTIAL ☐ ALLEGED  
03 POPULATION POTENTIALLY AFFECTED: \_\_\_\_\_ 04 NARRATIVE DESCRIPTION

The site is fenced, however, access is not completely restricted.

01 ☐ F. CONTAMINATION OF SOIL 02 ☐ OBSERVED (DATE: 05/10/88) ☐ POTENTIAL ☐ ALLEGED  
03 AREA POTENTIALLY AFFECTED: 17.5 04 NARRATIVE DESCRIPTION  
(Acres)

Some low level contamination was detected in subsurface soils. Concentrations, if accurate, are not of significant concern. Fill was applied to the site after landfilling was completed.

01 ☒ G. DRINKING WATER CONTAMINATION 02 ☐ OBSERVED (DATE: \_\_\_\_\_) ☐ POTENTIAL ☐ ALLEGED  
03 POPULATION POTENTIALLY AFFECTED: 50,000 04 NARRATIVE DESCRIPTION

See item "A".

01 ☒ H. WORKER EXPOSURE/INJURY 02 ☐ OBSERVED (DATE: 03/88) ☐ POTENTIAL ☐ ALLEGED  
03 WORKERS POTENTIALLY AFFECTED: \_\_\_\_\_ 04 NARRATIVE DESCRIPTION

A backhoe operator had reportedly suffered nasal and throat burns after inadvertently crushing two (2) duried drums.

01 ☐ I. POPULATION EXPOSURE/INJURY 02 ☐ OBSERVED (DATE: \_\_\_\_\_) ☐ POTENTIAL ☐ ALLEGED  
03 POPULATION POTENTIALLY AFFECTED: \_\_\_\_\_ 04 NARRATIVE DESCRIPTION

None reported.



POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION  
01 STATE 02 SITE NUMBER  
IND 982073215

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA  
04 NARRATIVE DESCRIPTION

02 ☐ OBSERVED (DATE: \_\_\_\_\_) ☒ POTENTIAL ☐ ALLEGED

The site is largely devoid of vegetation but activities at the site may be responsible for this, rather than the soil contamination.

01 ☐ K. DAMAGE TO FAUNA  
04 NARRATIVE DESCRIPTION (Include name(s) of species)

02 ☐ OBSERVED (DATE: \_\_\_\_\_) ☐ POTENTIAL ☐ ALLEGED

None reported.

01 ☐ L. CONTAMINATION OF FOOD CHAIN  
04 NARRATIVE DESCRIPTION

02 ☐ OBSERVED (DATE: \_\_\_\_\_) ☐ POTENTIAL ☐ ALLEGED

None reported.

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES

02 ☐ OBSERVED (DATE: 05/10/88) ☐ POTENTIAL ☐ ALLEGED

(Spills/Runoffs/ Standing liquids, Leaking drums)

03 POPULATION POTENTIALLY AFFECTED: \_\_\_\_\_ 04 NARRATIVE DESCRIPTION

The presence of drums in the subsurface has been verified as well as the release of the contents of two (2) drums.

01 ☐ N. DAMAGE TO OFFSITE PROPERTY  
04 NARRATIVE DESCRIPTION

02 ☐ OBSERVED (DATE: \_\_\_\_\_) ☐ POTENTIAL ☐ ALLEGED

None reported.

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs  
04 NARRATIVE DESCRIPTION

02 ☐ OBSERVED (DATE: \_\_\_\_\_) ☒ POTENTIAL ☐ ALLEGED

None reported or expected given the conditions at the site.

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING  
04 NARRATIVE DESCRIPTION

02 ☐ OBSERVED (DATE: \_\_\_\_\_) ☐ POTENTIAL ☐ ALLEGED

The City of Mishawaka was aware of the dumping. At the time there were few laws concerning waste disposal so the dumping should be considered legal.

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: 50,000

IV. COMMENTS

The site appears to pose a potentially serious threat to the Mishawaka municipal water supply. LSI activities are certainly justified at this site.

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Site inspection observations.  
Interview with local official, Mr. Mike Watson.



POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION  
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION  
01 STATE IND 02 SITE NUMBER 982073215

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
<input type="checkbox"/> A. NPDES				The site has no permits.
<input type="checkbox"/> B. UIC				
<input type="checkbox"/> C. AIR				
<input type="checkbox"/> D. RCRA				
<input type="checkbox"/> E. RCRA INTERIM STATUS				
<input type="checkbox"/> F. SPCC PLAN				
<input type="checkbox"/> G. STATE (Specify)				
<input type="checkbox"/> H. LOCAL (Specify)				
<input type="checkbox"/> I. OTHER (Specify)				
<input type="checkbox"/> J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE	04 TREATMENT (Check all that apply)	05 OTHER
<input type="checkbox"/> A. SURFACE IMPOUNDMENT			<input type="checkbox"/> A. INCINERATION	<input checked="" type="checkbox"/> A. BUILDINGS ON SITE
<input type="checkbox"/> B. PILES Solid Waste	unknown		<input type="checkbox"/> B. UNDERGROUND INJECTION	(1 building)
<input type="checkbox"/> C. DRUMS, ABOVE GROUND			<input type="checkbox"/> C. CHEMICAL/PHYSICAL	06 AREA OF SITE
<input type="checkbox"/> D. TANK, ABOVE GROUND			<input type="checkbox"/> D. BIOLOGICAL	17.5 (Acres)
<input type="checkbox"/> E. TANK, BELOW GROUND			<input type="checkbox"/> E. WASTE OIL PROCESSING	
<input checked="" type="checkbox"/> F. LANDFILL	estimated 2,500 drum equivalent		<input type="checkbox"/> F. SOLVENT RECOVERY	
<input type="checkbox"/> G. LANDFARM			<input type="checkbox"/> G. OTHER RECYCLING/RECOVERY	
<input type="checkbox"/> H. OPEN DUMP			<input type="checkbox"/> H. OTHER (Specify)	
<input type="checkbox"/> I. OTHER (Specify)				

07 COMMENTS

The waste quantity estimate was derived from disposal rates for another Uniroyal disposal site currently on the NPL. (Douglas Road Uniroyal Landfill).

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)
<input type="checkbox"/> A. ADEQUATE, SECURE <input type="checkbox"/> B. MODERATE <input type="checkbox"/> C. INADEQUATE, POOR <input checked="" type="checkbox"/> D. INSECURE, UNSOUND, DANGEROUS
02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC. Unknown number of drums were buried at the site. Disposal directly to water occurred, however, it is unclear whether primary disposal included direct dumping or drum disposal (or both). No liners or other containment structures are in place.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
02 COMMENTS Wastes are present in the subsurface.

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Interviews with local officials and information supplied by Uniroyal.  
State files.



POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION  
01 STATE IND 02 SITE NUMBER 982073215

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY  
(Check as applicable)

SURFACE WELL  
COMMUNITY A. ☐ B. ☒  
NON-COMMUNITY C. ☐ D. ☒

02 STATUS

ENDANGERED A. ☒ AFFECTED B. ☐ MONITORED C. ☒  
D. ☐ E. ☐ F. ☐

03 DISTANCE TO SITE

A. 1/4 (mi)  
B. unknown (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☒ A. ONLY SOURCE FOR DRINKING ☐ B. DRINKING (Other sources available)  
☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☐ D. NOT USED, UNUSEABLE  
(No other water sources available)

02 POPULATION SERVED BY GROUND WATER approx. 50,000

03 DISTANCE TO NEAREST DRINKING WATER WELL .2 (mi)

04 DEPTH TO GROUNDWATER

~ 10 (ft)

05 DIRECTION OF GROUNDWATER FLOW

N-NW (probable)

06 DEPTH TO AQUIFER OF CONCERN

~ 10 (ft)

07 POTENTIAL YIELD OF AQUIFER

High (gpd)

08 SOLE SOURCE AQUIFER

☒ YES ☐ NO

09 DESCRIPTION OF WELLS (including usage, depth, and location relative to population and buildings)

Information for the two (2) municipal wells sampled during SSI:  
Baker 7--63 ft. deep, screened from 46'9" to 63', static water level 8', capacity = 750 gpm.  
Byrkit 6--70 feet deep, screened from 55' to 70', capacity 1,000 gpm.

10 RECHARGE AREA

☒ YES ☐ NO  
COMMENTS The site was formerly a wetland area.

11 DISCHARGE AREA

☐ YES ☒ NO  
COMMENTS

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☒ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☐ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☐ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
<u>St. Joseph River</u>	<input type="checkbox"/>	<u>1/2 - 3/4</u> (mi)
	<input type="checkbox"/>	(mi)
	<input type="checkbox"/>	(mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE TWO (2) MILES OF SITE THREE (3) MILES OF SITE  
A. 4,000 B. 18,000 C. 40,000  
NO. OF PERSONS NO. OF PERSONS NO. OF PERSONS

02 DISTANCE TO NEAREST POPULATION

.1 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE

500 - 1,000 estimated

04 DISTANCE TO NEAREST OFF-SITE BUILDING

500 - 750 ft. (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

The site is located within the Mishawaka City limits. Population density is approximately 1,400 residents/square mile.



POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE IND 02 SITE NUMBER 982073215

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A.  $10^{-6} - 10^{-8}$  cm/sec ☐ B.  $10^{-4} - 10^{-6}$  cm/sec ☐ C.  $10^{-4} - 10^{-3}$  cm/sec ☒ D. GREATER THAN  $10^{-3}$  cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than  $10^{-6}$  cm/sec) ☐ B. RELATIVELY IMPERMEABLE ( $10^{-4} - 10^{-6}$  cm/sec) ☒ C. RELATIVELY PERMEABLE ( $10^{-2} - 10^{-4}$  cm/sec) ☐ D. VERY PERMEABLE (Greater than  $10^{-2}$  cm/sec)

03 DEPTH TO BEDROCK

~150 (ft)

04 DEPTH OF CONTAMINATED SOIL ZONE

unknown (ft)

05 SOIL pH

unknown

06 NET PRECIPITATION

+7 (in)

07 ONE YEAR 24 HOUR RAINFALL

2.4 (in)

08 SLOPE

SITE SLOPE  
<1 %

DIRECTION OF SITE SLOPE  
surface slopes  
primarily to the north

TERRAIN AVERAGE SLOPE  
unknown  
relatively flat

09 FLOOD POTENTIAL

SITE IS IN >500 YEAR FLOODPLAIN

10

☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE

OTHER

A. N/A (mi)

B. 1/2-1 (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

N/A (mi)

N/A

ENDANGERED SPECIES:

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL

RESIDENTIAL AREAS; NATIONAL/STATE PARKS,  
FORESTS, OR WILDLIFE RESERVES

AGRICULTURAL LANDS  
PRIME AG LAND AG LAND

A. 1,000 ft. (mi)

B. 500 ft. (mi)

C. N/A (mi)

D. 3 (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

Topography at and around the site is relatively flat with a slope of less than 1% between the site and the St. Joseph River to the north. Movement of soil on-site has created several small mounds, but these mounds have very limited influence on surface run-off.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

State files.

Indiana Scoring Model Manual.

Geologic assessment completed by Mr. Billy Giles, IDEM.





POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION

01 STATE 02 SITE NUMBER  
IND 982073215

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILAB
GROUNDWATER	4	EMS Laboratory, Indianapolis, IN	06/10/88
SURFACE WATER	1	and EIS Labs, South Bend, IN	for QA/QC analysis
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL	2		
VEGETATION			
OTHER	1 trip blank		

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS
Magnetometer Survey	Much greater variation in the magnetic field at the site as compared with a nearby background.
Hnu Photoionization Detector-	No concentration above background were noted.

IV. PHOTOGRAPHS AND MAPS

01 TYPE <input checked="" type="checkbox"/> GROUND <input checked="" type="checkbox"/> AERIAL	02 IN CUSTODY OF <u>Indiana Dept. of Environmental Management</u> <small>(Name of organization or individual)</small>
03 MAPS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	04 LOCATION OF MAPS <u>Included in report.</u>

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

N/A

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

All the above information was obtained during or in preparation for the SSI by Mr. Tim Heffernan, IDEM.



POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART 7 - OWNER INFORMATION

I. IDENTIFICATION

01 STATE 02 SITE NUMBER  
IND 982073215

II. CURRENT OWNER(S)				PARENT COMPANY (if applicable)			
01 NAME Dearborn Fabricating		02 D+B NUMBER		08 NAME		09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.) 1131 East Fifth Street		04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE	
05 CITY Mishawaka		06 STATE IN	07 ZIP CODE 46544	12 CITY		13 STATE	14 ZIP CODE
01 NAME		02 D+B NUMBER		08 NAME		09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE	
05 CITY		06 STATE	07 ZIP CODE	12 CITY		13 STATE	14 ZIP CODE
01 NAME		02 D+B NUMBER		08 NAME		09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE	
05 CITY		06 STATE	07 ZIP CODE	12 CITY		13 STATE	14 ZIP CODE
01 NAME		02 D+B NUMBER		08 NAME		09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE	
05 CITY		06 STATE	07 ZIP CODE	12 CITY		13 STATE	14 ZIP CODE
01 NAME		02 D+B NUMBER		08 NAME		09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE	
05 CITY		06 STATE	07 ZIP CODE	12 CITY		13 STATE	14 ZIP CODE
III. PREVIOUS OWNER(S) (List most recent first)				IV. REALTY OWNER(S) (if applicable, list most recent first)			
01 NAME Mr. Leo Reider		02 D+B NUMBER		01 NAME		02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.) Unknown		04 SIC CODE		03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	
05 CITY		06 STATE	07 ZIP CODE	05 CITY		06 STATE	07 ZIP CODE
01 NAME		02 D+B NUMBER		01 NAME		02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE		03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	
05 CITY		06 STATE	07 ZIP CODE	05 CITY		06 STATE	07 ZIP CODE
01 NAME		02 D+B NUMBER		01 NAME		02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE		03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	
05 CITY		06 STATE	07 ZIP CODE	05 CITY		06 STATE	07 ZIP CODE
V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)							
Penn Township Assessors office. Personal Communication, Mr. Larry Dunville, current owner of Dearborn Fabricating.							



POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION

01 STATE 02 SITE NUMBER  
IND 982073215

II. CURRENT OPERATOR (Provide if different from owner)

OPERATOR'S PARENT COMPANY (If applicable)

01 NAME City of Mishawaka	02 D+B NUMBER	10 NAME	11 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.) 600 East Third Street	04 SIC CODE	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE
05 CITY Mishawaka	06 STATE IN	07 ZIP CODE 46544	14 CITY
08 YEARS OF OPERATION late 1940's Approx. 40	09 NAME OF OWNER Larry Dunville (Dearborn Fabricating)	15 STATE	16 ZIP CODE

III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner)

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

01 NAME Uniroyal, Inc.	02 D+B NUMBER	10 NAME	11 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.) 312 North Hill Street	04 SIC CODE	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE
05 CITY Mishawaka	06 STATE IN	07 ZIP CODE 46544	14 CITY
08 YEARS OF OPERATION 1946-1954 Approx. 8	09 NAME OF OWNER DURING THIS PERIOD Leo Reider	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER	10 NAME	11 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	14 CITY
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER	10 NAME	11 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	14 CITY
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD	15 STATE	16 ZIP CODE

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Mr. Larry Dunville, owner.  
Internal Memoranda provided by Uniroyal Plastics Company.  
Mr. Mike Watson, Mishawaka Fire Chief.



POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION

01 STATE 02 SITE NUMBER  
IND 982073215

II PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

N/A

01 ☐ S. CAPPING/COVERING  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

N/A

01 ☐ T. BULK TANKAGE REPAIRED  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

N/A

01 ☐ U. GROUT CURTAIN CONSTRUCTED  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

N/A

01 ☐ V. BOTTOM SEALED  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

N/A

01 ☐ W. GAS CONTROL  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

N/A

01 ☐ X. FIRE CONTROL  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

N/A

01 ☐ Y. LEACHATE TREATMENT  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

N/A

01 ☐ Z. AREA EVACUATED  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

N/A

01 ☐ 1. ACCESS TO SITE RESTRICTED  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

N/A

01 ☐ 2. POPULATION RELOCATED  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

N/A

01 ☐ 3. OTHER REMEDIAL ACTIVITIES  
04 DESCRIPTION

02 DATE 1986

03 AGENCY \_\_\_\_\_

VOCs were detected in some municipal wells, especially well #6 at the main well field, located just south of the St. Joe River, and northeast of the site. Levels did not exceed EPA standards. The source of contaminants was not determined.

14 interceptor wells were put up around the well field to monitor the production wells; no contaminants were found in the outgoing water. Testing and monitoring of the water are done regularly.

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

State files.

Jim Crook, Mishawaka Municipal Utilities



POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION

01 STATE IND	02 SITE NUMBER 982073215
-----------------	-----------------------------

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ☒ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)



POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION

01 STATE 02 SITE NUMBER  
IND 982073215

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER	
N/A		
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	
05 CITY	06 STATE 07 ZIP CODE	

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
Uniroyal, Inc.		City fo Mishawaka	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
312 North Hill Street		600 East Third Street	
05 CITY	06 STATE 07 ZIP CODE	05 CITY	06 STATE 07 ZIP CODE
Mishawaka	IN 46544	MIshawaka	IN 46544
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
Additional generators possible.			
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE 07 ZIP CODE	05 CITY	06 STATE 07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
Unknown			
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE 07 ZIP CODE	05 CITY	06 STATE 07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE 07 ZIP CODE	05 CITY	06 STATE 07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Mr. Mike Watson, Mishawaka Fire Chief.  
Mr. Larry Dunville, owner.  
Uniroyal memoranda.



POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION

01 STATE 02 SITE NUMBER  
TND 982073215

II. PAST RESPONSE ACTIVITIES

01 <input type="checkbox"/> A. WATER SUPPLY CLOSED 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> B. TEMPORARY WATER SUPPLY PROVIDED 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> C. PERMANENT WATER SUPPLY PROVIDED 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> D. SPILLED MATERIAL REMOVED 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> E. CONTAMINATED SOIL REMOVED 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> F. WASTE REPACKAGED 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> G. WASTE DISPOSED ELSEWHERE 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> H. ON SITE BURIAL 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> I. IN SITU CHEMICAL TREATMENT 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> J. IN SITU BIOLOGICAL TREATMENT 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> K. IN SITU PHYSICAL TREATMENT 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> L. ENCAPSULATION 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> M. EMERGENCY WASTE TREATMENT 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> N. CUTOFF WALLS 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> O. EMERGENCY DIKING/SURFACE WATER DIVERSION 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> P. CUTOFF TRENCHES/SUMP 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> Q. SUBSURFACE CUTOFF WALL 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____

APPENDIX C

IDEM SITE PHOTOGRAPHS



APPENDIX C  
SITE PHOTOGRAPHS

C-1

PHOTOGRAPHY LOG SHEET

SITE OLD Mishawaka Dump  
DATE 5-10-88  
TIME 1:30 pm  
DIRECTION \_\_\_\_\_  
WEATHER \_\_\_\_\_

PHOTOGRAPHED BY:

Tim Heffernan

SAMPLE ID # (IF APPLICABLE)

C 3373

DESCRIPTION: Soil Sample Collected from Drum Pit  
Wall (approx. depth = 8 ft.)

Page

SITE OLD Mishawaka Dump

COUNTY St. Joseph

SAMPLE C 3373

DATE 5-10-88

TIME 1:30 AM PM

SITE OLD Mishawaka Dump

DATE 5-10-88

TIME 1:45 pm

DIRECTION \_\_\_\_\_

WEATHER \_\_\_\_\_

PHOTOGRAPHED BY:

Tim Heffernan

SAMPLE ID # (IF APPLICABLE)

C 3374

DESCRIPTION: Duplicate of C 3373

OLD Mishawaka Dump

St. Joseph

C 3374

10-88

5 AM PM

PHOTOGRAPHY LOG SHEET

Page \_\_\_\_\_

SITE OLD Mishawaka Dump

DATE 5-10-88

TIME 2:15 pm

DIRECTION \_\_\_\_\_

WEATHER \_\_\_\_\_

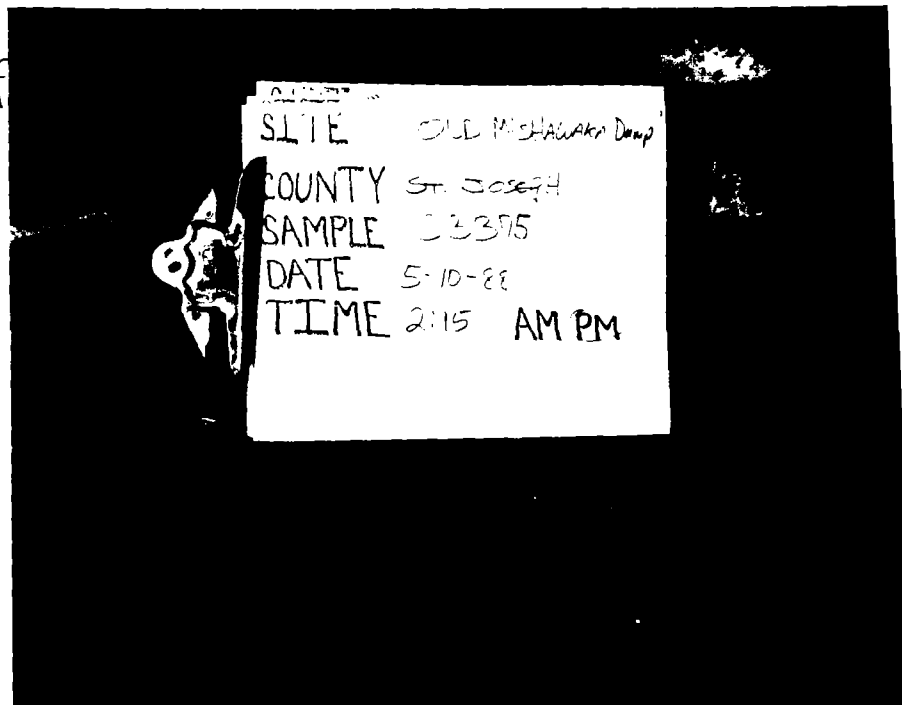
PHOTOGRAPHED BY:

Tim Heffernan

SAMPLE ID # (IF APPLICABLE)

C 3375

DESCRIPTION: Ditchwater - Exposed Groundwater  
From Drum Pit



SITE OLD Mishawaka Dump

DATE 5-10-88

TIME 2:25 pm

DIRECTION \_\_\_\_\_

WEATHER \_\_\_\_\_

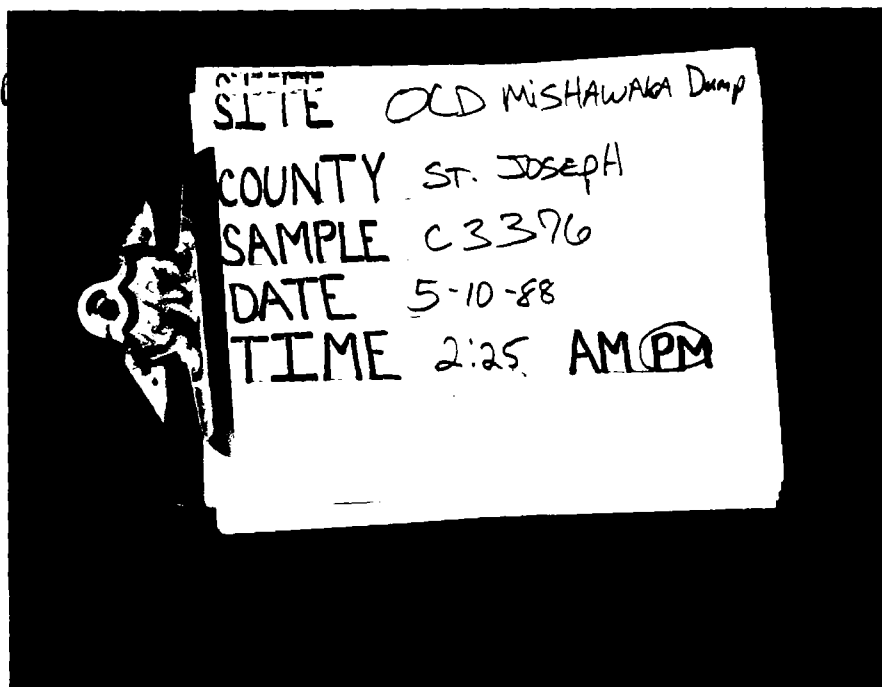
PHOTOGRAPHED BY:

Tim Heffernan

SAMPLE ID # (IF APPLICABLE)

C3376

DESCRIPTION: Duplicate of C 3375



PHOTOGRAPHY LOG SHEET

Page

SITE OLD MISHAWAKA Dump

DATE 5-10-88

TIME \_\_\_\_\_

DIRECTION \_\_\_\_\_

WEATHER \_\_\_\_\_

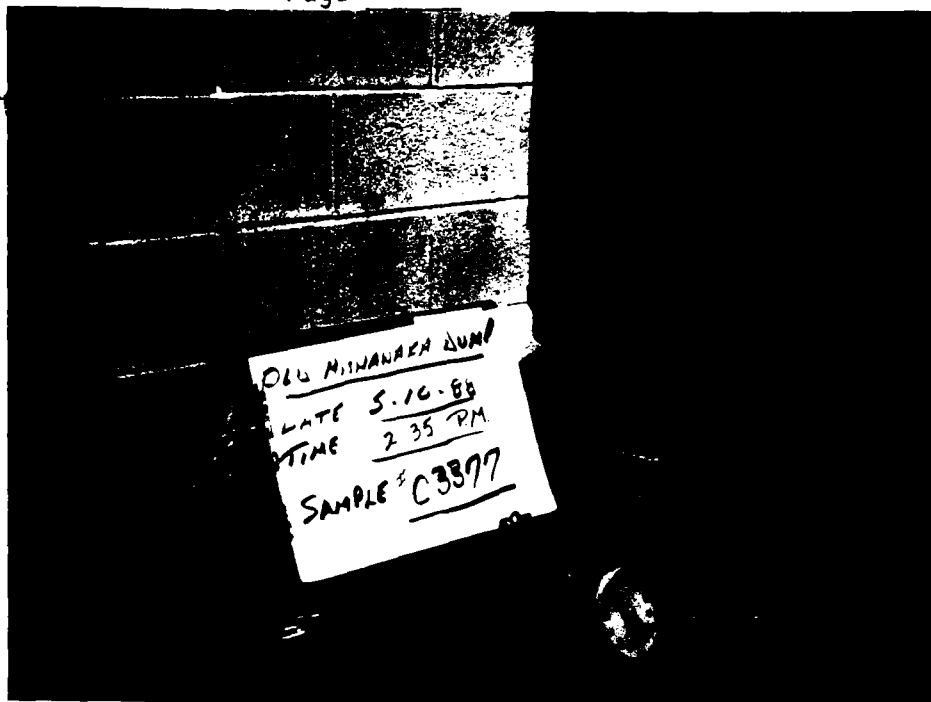
PHOTOGRAPHED BY:

HARRY ATKINSON

SAMPLE ID # (IF APPLICABLE)

C 3377

DESCRIPTION: Municipal Well Sample  
WELL BAKER-7



SITE OLD MISHAWAKA Dump

DATE 5-10-88

TIME \_\_\_\_\_

DIRECTION \_\_\_\_\_

WEATHER \_\_\_\_\_

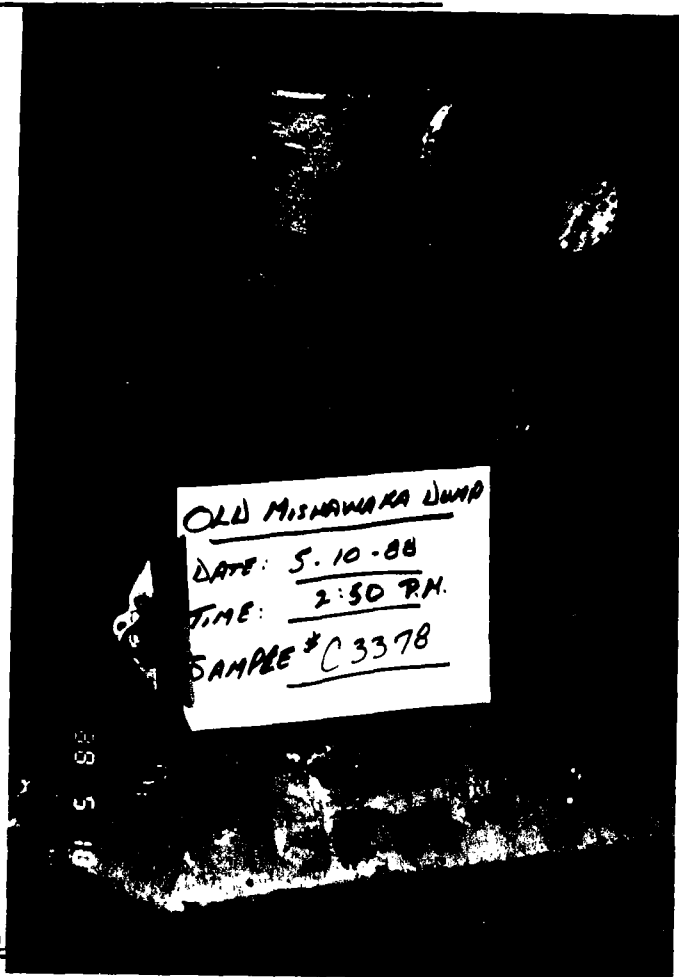
PHOTOGRAPHED BY:

HARRY ATKINSON

SAMPLE ID # (IF APPLICABLE)

C 3378

DESCRIPTION: Municipal Well Sample  
WELL Blackie-6



PHOTOGRAPHY LOG SHEET

Page \_\_\_\_\_

SITE OLD MISHAWAKA Dump

DATE 3-23-88

TIME \_\_\_\_\_

DIRECTION \_\_\_\_\_

WEATHER SUNNY, WARM

PHOTOGRAPHED BY:

Tim Heffernan

SAMPLE ID # (IF APPLICABLE)

DESCRIPTION: DRUM REMOVED FROM PIT BY CITY

PERSONNEL SAMPLED BY IDEM 3-23-88 RESULTS INCONCLUSIVE



SITE OLD MISHAWAKA Dump

DATE 3-23-88

TIME \_\_\_\_\_

DIRECTION \_\_\_\_\_

WEATHER \_\_\_\_\_

PHOTOGRAPHED BY:

Tim Heffernan

SAMPLE ID # (IF APPLICABLE)

DESCRIPTION: GENERAL PHOTO OF THE SITE



APPENDIX D  
CHEMICAL ANALYSIS DATA

## DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

INDIANAPOLIS

OFFICE MEMORANDUM

DATE: August 9, 1988

THRU: ~~Gregory A. Busch~~ *jc 12/27/88*  
Jack C. Corpuz  
Harry E. Atkinson *12/12/89*

TO: Tim Heffernan  
Site Investigation Section

FROM: Dan Raveed *DR 12/27/88*  
Chemical Evaluation Section

SUBJECT: Review of Laboratory Results for Old Mishawaka Dump,  
St. Joseph County  
Collected on May 10, 1988; Samples C3373-C3380  
Analyzed by EMS Laboratories and EIS Environmental Engineers

I have reviewed the attached laboratory results and have determined that they are acceptable for use. These results have been evaluated for the quality criteria contained in the Indiana Quality Assurance Project Plan (QAPP). Any exceptions to the acceptance of this data will be identified in this memorandum and should remain attached to the original results.

Field duplicate samples are used to establish the representativeness of the sampling (i.e., sampling error and/or sample homogeneity). The field duplicates compare well.

No significant concentrations of heavy metals, semi-volatile organics, or volatile organic compounds were detected. The ditchwater duplicate samples (C3375 and C3376) contained a small amount of 1,2-dichloropropane. They averaged a total of 260 ng per liter of the PCBs, Aroclor 1254 and Aroclor 1260. This is about 250 times the  $10^{-5}$  cancer risk factor, a cause for concern.

DR/ram

Attachments

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
OFFICE OF SOLID AND HAZARDOUS WASTE MANAGEMENTSITE INFORMATION

Control #'s C3373 - C3380 Tasks Requested SVOA, TOTAL METALS, VOA, PCB's  
Site Location (city, county): MISHAWAKA, ST. JOSEPH (OLD MISHAWAKA Dump)  
Conditions: Sky        Ground        Wind        Temp         
Collectors: Tim Heffernan, Bruce Oertel

Container	Total #	Accepting Laboratory
1 L Plastic	<u>7</u>	<u>EIS</u>
1 L Glass	<u>18</u>	Address <u>IRONWOOD Rd., SOUTH BEND</u>
500 ml Glass	<u>3</u>	<u>SVOA - EMS, W. MORRIS, INDIANAPOLIS</u> Phone <u>      </u>
40 ml Vials	<u>18</u>	Container Source <u>EIS</u>
other <u>      </u>		

Sample Iced? (YES) NO  
Preservative Used? (YES) NO

Sample Types (circle): Mon. Well Lagoon Ash Indus Waste  
Leachate (Soil) Waste Pile Creek Ditch  
Sludge Solvent Solid Liquid Oil Sand  
Drummed Waste Truck (Res. Well) other POUND

Sample Plan Review: (grab/composite) statistical/random/(judgemental)  
Information on equipment used, facility type, products made, etc.  
SAMPLING TO DETERMINE CONTENTS OF SEVERAL DRUMS EXPOSED + RUPTURED DURING EXCAVATION OF A PIT AND TO DETERMINE WHETHER CONTAMINANTS HAVE MIGRATED TO A NEARBY POND AND MUNICIPAL WELLS.

Decontamination Procedures Used: NON-PHOSPHATE DETERGENT WASH AND WATER RINSE FOR ALL NON-DISPOSABLE ITEMS.

Equipment is (dedicated/decontaminated) Source of decon. water         
Source of blank reagent water EIS

## Miscellaneous:

Photos taken? (YES) NO  
Program Area: RCRA (CERCLA) SOLID WASTE other         
Purpose: Complaint Compliance Enforcement  
Constituents expected: SOLVENTS (TCE, MEK, Acetone, Methylene Cl)

Results due by 5/31/88 Handling Precautions? (YES) NO  
Approximate Concentrations (worst case):  
L.T. 10 ppm 100ppm (1000ppm) 5% 10% G.T. 15%  
OR Higher



INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
OFFICE OF SOLID AND HAZARDOUS WASTE MANAGEMENTSAMPLE SHEETSampler ID \_\_\_\_\_ DEM/OSHW Control # C3373Field Test  
Performed

Result

N/A

Sample Types (circle all applicable)

Mon. Well

Lagoon

Ash

Indust. Waste

Res. Well

Leachate

Soil

Waste Pile

Creek

Oil

Sludge

Solid

Ditch

Solvent

Sand

Liquid

Truck

Drum

other \_\_\_\_\_

Blank (Equip./Trip)

Duplicate (of \_\_\_\_\_)

Background

Sample Date: 5-10-88Time: 1:30 AM/PM

Containers

#

1 L plastic

1 L glass

500 ml glass

40 ml vial

Preservatives

H<sub>2</sub>SO<sub>4</sub> (50%)HNO<sub>3</sub> (conc.)

NaOH (50%)

Zn-Acetate (2N)

Lab/Lot Number

Sample IcedNo preservatives used for  
non-aqueous samples

Additional Sample Location Information:

SOIL SAMPLE FROM BASE OF THE EXCAVATION PIT - APPROX 6 INCHES  
ABOVE THE WATER LINEAdditional Sample Type Information/Observations: (depth taken, color, odor,  
size, clarity, density, suspended solids, colloidal, etc.)SANDY W/ SOME GRAVEL, WET BUT NOT SATURATED

Deviations From Sampling Plan: \_\_\_\_\_

Sampling Equipment Used: POUAC DREDGE SAMPLER

Signature

Timothy C. Heffernan

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
OFFICE OF SOLID AND HAZARDOUS WASTE MANAGEMENTSAMPLE SHEETSampler ID \_\_\_\_\_ DEM/OSHW Control # C3325

<u>Field Test</u> <u>Performed</u>	<u>Result</u>	<u>Sample Types</u> (circle all applicable)			
<u>N/A</u>	_____	Mon. Well	Lagoon	Ash	Indust. Waste
_____	_____	Res. Well	Leachate	Soil	Waste Pile
_____	_____	Creek	Oil	Sludge	Solid
_____	_____	<u>Ditch</u>	Solvent	Sand	<u>Liquid</u>
_____	_____	Truck	Drum	other	<u>WATER</u>
_____	_____	Blank (Equip./Trip)	Duplicate (of _____)		
_____	_____	Background			

Sample Date: 5-10-88 Time: 2:15 AM/PM (PM)

<u>Containers</u>	<u>#</u>	<u>Preservatives</u>	<u>Lab/Lot Number</u>
1 L plastic	<u>1</u>	H <sub>2</sub> SO <sub>4</sub> (50%)	<u>VOA only</u>
1 L glass	<u>2</u>	HNO <sub>3</sub> (conc.)	<u>FOR METALS (1L PLASTIC)</u>
500 ml glass	_____	NaOH (50%)	_____
40 ml vial	<u>2</u>	Zn-Acetate (2N)	_____
_____	_____	<u>Sample Iced</u>	_____
No preservatives used for non-aqueous samples			

## Additional Sample Location Information:

EXPOSED GROUNDWATER AT A DEPTH OF APPROX. 10 FEET

## Additional Sample Type Information/Observations: (depth taken, color, odor, size, clarity, density, suspended solids, colloidal, etc.)

TURBID, ONLY SHEEN WAS EVIDENT IN THE WATER IN THE PIT

Deviations From Sampling Plan: \_\_\_\_\_

Sampling Equipment Used: \_\_\_\_\_

Signature

Timothy C. Hoffman

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
OFFICE OF SOLID AND HAZARDOUS WASTE MANAGEMENTSAMPLE SHEETSampler ID \_\_\_\_\_ DEM/OSHW Control # C3376

Field Test Performed	Result	<u>Sample Types</u> (circle all applicable)			
<u>N/A</u>	_____	Mon. Well	Lagoon	Ash	Indust. Waste
_____	_____	Res. Well	Leachate	Soil	Waste Pile
_____	_____	Creek	Oil	Sludge	Solid
_____	_____	<u>Ditch</u>	Solvent	Sand	Liquid
_____	_____	Truck	Drum	other <u>(WATER)</u>	_____
_____	_____	Blank (Equip./Trip)	Duplicate (of <u>C3375</u> )	_____	_____
_____	_____	Background	_____	_____	_____

Sample Date: 5-10-88 Time: 2:25 AM/PM (PM)

Containers	#	Preservatives	Lab/Lot Number
1 L plastic	<u>1</u>	H <sub>2</sub> SO <sub>4</sub> (50%)	<u>For VOA</u>
1 L glass	<u>2</u>	HNO <sub>3</sub> (conc.)	<u>For IL PLASTIC</u>
500 ml glass	_____	NaOH (50%)	_____
40 ml vial	<u>2</u>	Zn-Acetate (2N)	_____
_____	_____	<u>Sample Iced</u>	_____
_____	_____	No preservatives used for non-aqueous samples	_____

Additional Sample Location Information:

Duplicate of C3375

Additional Sample Type Information/Observations: (depth taken, color, odor, size, clarity, density, suspended solids, colloidal, etc.)

Deviations From Sampling Plan: \_\_\_\_\_

Sampling Equipment Used: \_\_\_\_\_

Signature

Timothy C. Hefner

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
OFFICE OF SOLID AND HAZARDOUS WASTE MANAGEMENT

SAMPLE SHEET

Sampler ID \_\_\_\_\_ DEM/OSHW Control # C3377

<u>Field Test Performed</u>	<u>Result</u>	<u>Sample Types</u> (circle all applicable)			
		<u>Mon. Well</u>	Lagoon	Ash	Indust. Waste
<u>N/A</u>		<u>Res. Well</u>	<u>Municipal Leachate</u>	Soil	Waste Pile
		Creek	Oil	Sludge	Solid
		Ditch	Solvent	Sand	Liquid
		Truck	Drum	other	
		Blank (Equip./Trip)		Duplicate (of _____)	
		Background			

Sample Date: 5-10-88 Time: 2:30 AM/PM PM

<u>Containers</u>	<u>#</u>	<u>Preservatives</u>	<u>Lab/Lot Number</u>
1 L plastic	<u>2</u>	H <sub>2</sub> SO <sub>4</sub> (50%)	<u>For VOA</u>
1 L glass	<u>4</u>	HNO <sub>3</sub> (conc.)	<u>For IL PLASTICS</u>
500 ml glass		NaOH (50%)	
40 ml vial	<u>4</u>	Zn-Acetate (2N)	
		<u>Sample Iced</u>	
		No preservatives used for non-aqueous samples	

## Additional Sample Location Information:

BAKER 7 WELL, MISHAWAKA MUNICIPAL UTILITIES  
SOUTH SIDE OF WARD BAKER PARK

## Additional Sample Type Information/Observations: (depth taken, color, odor, size, clarity, density, suspended solids, colloidal, etc.)

CLEAR, DRAWN FROM PUMPING STATION TAP

Deviations From Sampling Plan: CHOSEN AS SPIKE MATRIX SAMPLE STATION

Sampling Equipment Used: \_\_\_\_\_

Signature

Timothy C. Heffernan

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
OFFICE OF SOLID AND HAZARDOUS WASTE MANAGEMENTSAMPLE SHEETSampler ID \_\_\_\_\_ DEM/OSHW Control # C3378

Field Test Performed	Result	<u>Sample Types</u> (circle all applicable)			
<u>N/A</u>	_____	Mon. Well	Lagoon	Ash	Indust. Waste
		<u>Res. Well</u>	Leachate	Soil	Waste Pile
		Creek	Oil	Sludge	Solid
		Ditch	Solvent	Sand	Liquid
		Truck	Drum	other	
		Blank (Equip./Trip)	Duplicate (of _____)		
		Background			

Sample Date: 5-10-88 Time: 2:45 AM/PM (PM)

Containers	#	Preservatives	Lab/Lot Number
1 L plastic	<u>1</u>	H <sub>2</sub> SO <sub>4</sub> (50%)	<u>For VOA</u>
1 L glass	<u>2</u>	HNO <sub>3</sub> (conc.)	<u>For IL PLASTIC</u>
500 ml glass	_____	NaOH (50%)	_____
40 ml vial	<u>2</u>	Zn-Acetate (2N)	_____
		<u>Sample Iced</u>	
No preservatives used for non-aqueous samples			

## Additional Sample Location Information:

Byrkitt Co Well, Mishawaka Municipal Utilities  
NORTHEAST OF BAKER WELL IN WARD BAKER PARK

## Additional Sample Type Information/Observations: (depth taken, color, odor, size, clarity, density, suspended solids, colloidal, etc.)

CLEAR, TAKEN FROM Byrkitt pump station TAP.

Deviations From Sampling Plan: \_\_\_\_\_

Sampling Equipment Used: \_\_\_\_\_

Signature Timothy C. Heffernan

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
OFFICE OF SOLID AND HAZARDOUS WASTE MANAGEMENTSAMPLE SHEETSampler ID \_\_\_\_\_ DEM/OSHW Control # C3399

Field Test Performed	Result	Sample Types (circle all applicable)			
<u>N/A</u>	_____	Mon. Well	Lagoon	Ash	Indust. Waste
_____	_____	Res. Well	Leachate	Soil	Waste Pile
_____	_____	Creek	Oil	Sludge	Solid
_____	_____	Ditch	Solvent	Sand	Liquid
_____	_____	Truck	Drum	other	_____
_____	_____	<u>Blank</u> (Equip. <u>Trip</u> )	Duplicate (of _____)		
_____	_____	Background			

Sample Date: 5-10-88 Time: 11:30 AM/PM

Containers	#	Preservatives	Lab/Lot Number
1 L plastic	<u>1</u>	H <sub>2</sub> SO <sub>4</sub> (50%)	<u>For VJA</u>
1 L glass	<u>2</u>	HNO <sub>3</sub> (conc.)	<u>For 1 L PLASTIC</u>
500 ml glass	_____	NaOH (50%)	_____
40 ml vial	<u>2</u>	Zn-Acetate (2N)	_____
_____	_____	<u>Sample Iced</u>	_____
No preservatives used for non-aqueous samples			

## Additional Sample Location Information:

BLANK - OBTAINED FROM EIS PRIOR TO SAMPLING. WE THEN  
LABELLED IT ALONG WITH OUR OTHER SAMPLES TO PREVENT PREMATURE  
IDENTIFICATION OF THE SAMPLE AS A BLANK.

## Additional Sample Type Information/Observations: (depth taken, color, odor, size, clarity, density, suspended solids, colloidal, etc.)

CLEARDeviations From Sampling Plan: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_Sampling Equipment Used: \_\_\_\_\_  
\_\_\_\_\_Signature Timothy C. Heffernan

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
OFFICE OF SOLID AND HAZARDOUS WASTE MANAGEMENTSAMPLE SHEETSampler ID \_\_\_\_\_ DEM/OSHW Control # C3380

## Field Test

PerformedResultN/ASample Types (circle all applicable)

Mon. Well	Lagoon	Ash	Indust. Waste
Res. Well	Leachate	Soil	Waste Pile
Creek	Oil	Sludge	Solid
Ditch	Solvent	Sand	Liquid
Truck	Drum	other <u>POND</u>	
Blank (Equip./Trip)	Duplicate (of _____)		
Background			

Sample Date: 5-10-88 Time: 2:45 AM/PM (PM)Containers

## #

1 L plastic

1

1 L glass

2

500 ml glass

2

40 ml vial

2PreservativesH<sub>2</sub>SO<sub>4</sub> (50%)HNO<sub>3</sub> (conc.)NaOH (50%)Zn-Acetate (2N)Sample IcedNo preservatives used for  
non-aqueous samplesLab/Lot NumberFOR VOIAFOR 1L PLASTIC

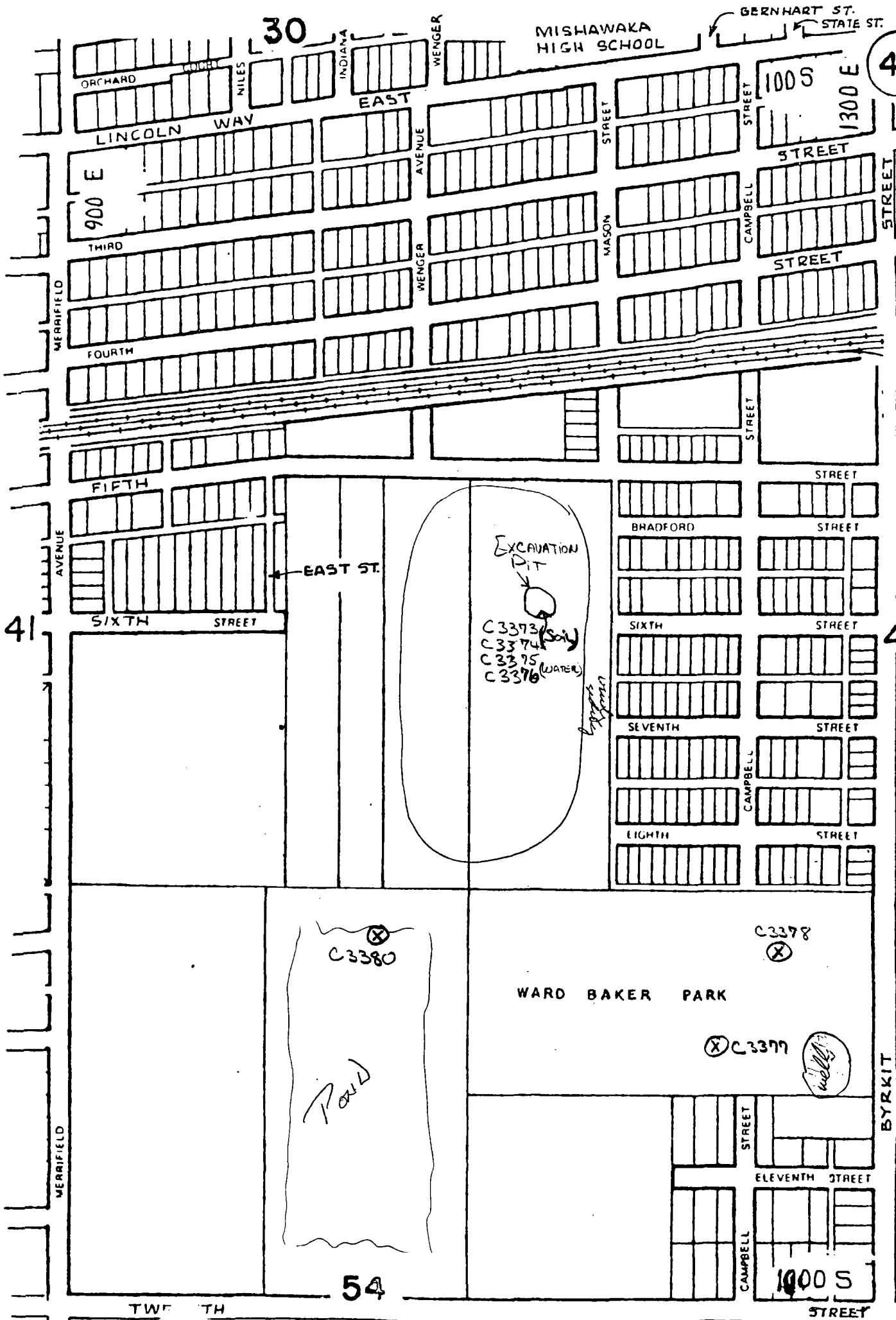
## Additional Sample Location Information:

SAMPLE COLLECTED IN THE POND LOCATED JUST SOUTH OF THE  
DUMP SITE AND IMMEDIATELY WEST OF THE WARD BAKER PARKAdditional Sample Type Information/Observations: (depth taken, color, odor,  
size, clarity, density, suspended solids, colloidal, etc.)VERY SLIGHT TURBIDITY, NO ODOR WAS EVIDENT, ~~THE~~ VERY LITTLE COLOR

## Deviations From Sampling Plan: \_\_\_\_\_

## Sampling Equipment Used: \_\_\_\_\_

Signature Timothy C. Hoffman





[illegible]

Page 11 of 12

## INDIANA DEPT. OF ENVIRONMENTAL MGMT.

## CHAIN OF CUSTODY

Date: 5-10-88

Samples were collected by or in the presence of: Jim Heffernan

<u>SAMPLE #</u>	<u>DESCRIPTION</u>	<u>TIME COLLECTED</u>
C3373	SOIL/SED.	1:30p
C3374	SOIL/SED.	1:45p
C3375	EXPOSED GROUNDWATER	2:15p
C3376	EXPOSED GROUNDWATER	2:25p
C3377	<del>EXPOSED</del> GROUNDWATER	2:30p
C3378	WATER	2:45p
C3379	WATER	2:45
C3380	WATER	2:45

FOR Task #1 &amp; Task #5

30 day turnaround

Samples Relinquished By: Timothy C. Heffernan

Title or Position: ENV. Scientist III

Samples Received By: [Signature]

Title or Position: Lab MGR.

FIGURE 3-8

Page 10 of 12ANALYSIS REQUEST  
SOLID WASTE MATRIX SHEET

Control #'s \_\_\_\_\_ - \_\_\_\_\_

	A	B	C	D	E	F	G
D001	NA						
D002					NA	NA	NA
D003-CN D003-S						NA	NA
EPTOX							
EPTOX 15							
Total Metals (Task 1)	✓			✓			
% Solids							
VOA (Task 5)	✓			✓			
SVOA (Task 6)	✓			✓			
PCBs/Pesticides (Task 7)							
PCBs	✓			✓			
BTU	NA						
Fuels Fingerprint							
Special Analytical Services (SAS)		attach SAS request sheet					

A. Waters	Samples <u>8</u>
B. Fluids	Samples _____
C. Sludges	Samples _____
D. Solids	Samples <u>2</u>
E. Waste Oils	Samples _____
F. Solvents	Samples _____
G. Fuels	Samples _____

Turn-Around Required

30 day  
14 day  
7 day\*  
2 day\*

0564c/GAB

\*Lab must confirm with QAO

QAO(signature) \_\_\_\_\_

STATE OF INDIANA  
**INVOICE - VOUCHER**

Warrant No. \_\_\_\_\_

**VENDOR FILL IN.** Prepare a separate invoice for each purchase order received. Make five copies.

Invoice Number 110915 Date 5-31-88 19  

Vendor's Name and Address EMS LABORATORIES, INC.  
PO BOX 66002  
INDIANAPOLIS, IN 46266

Delivered to IDEM  
105 S. Meridian St.  
Chesapeake Building  
PO Box 6015  
Indianapolis, IN 46206-6015  
Attn: Carla Hatton

**IMPORTANT.** Send three copies of this invoice directly to:  
**AUDITOR OF STATE, STATE HOUSE, INDIANAPOLIS**  
Do not send to State Agency to whom delivery was made.

**VENDOR FILL IN.** Enter below the data that appears in the upper right corner of the Purchase Order issued to you.

Order Number P- 87-601339  
Account Number 361-424.370  
State Agency Dept. of Environmental Mgt.  
Appr. Name Solid & Hazardous Waste Mgt.

**VENDOR LEAVE BLANK**

Gross Amt. \_\_\_\_\_

Discount \_\_\_\_\_

AMT. LIQ. \_\_\_\_\_ AMT. PAID \_\_\_\_\_

CHECKED	POSTED	OBJECT	AMOUNT
Ext	PO		
PO	E&E		
RR	AL		

Approved for Payment \_\_\_\_\_

Spec. No.	Quantity	Unit	Article and Description	Unit Price	Amount
			102536-102543 - C3373-C3380  <i>Old Mishawaka Dump St. Joseph Co.</i>		\$3141.24
GROSS AMOUNT OF INVOICE (Subject to terms below)					\$3141.24

**VENDOR:** Execute certificate below. **SHOW TERMS HERE:** **NET DUE UPON RECEIPT**

Pursuant to the provisions and penalties of Chapter 155 Acts of 1951.

I hereby certify that the foregoing account is just and correct and that no part of the same has been paid.

Date 6-1-88

X EMS LABORATORIES, INC.

X By Joy Whalin

X 7901 W. Morris St.

X Indianapolis, IN 46231

(City)

(State)

# I N V O I C E

----- CORRESPOND TO -----

INVOICE -----

EMS LABORATORIES, INC.  
7901 W. MORRIS ST.  
INDIANAPOLIS, IN 46231  
(317) 243-8305

NUMBER : 110915  
DATE : 05/31/88  
CLIENT ID : 1159

----- REMIT ONLY TO -----

EMS LABORATORIES, INC.  
P.O. BOX 66002  
INDIANAPOLIS, IN 46266

\* MINIMUM SAMPLE CHARGE \$25.00 \* NET DUE UPON RECEIPT \* 1.5% PER MONTH AFTER 30 DAYS \*

----- BILL TO -----

CARLA HATTON  
INDIANA DEPARTMENT OF ENVIRONMENTAL MGT.  
P.O. BOX 6015  
INDIANAPOLIS IN 46206-6015

----- REPORT TO -----

GREG BUSCH  
INDIANA DEPARTMENT OF ENVIRONMENTAL MGT.  
P.O. BOX 6015  
INDIANAPOLIS IN 46206-6015

DESCRIPTION	CHARGES	MATRIX FEES	PRIORITY PREMIUM	TOTAL
*****				
SAMPLE : 102536 P.O. NO : 87-601339-11 C3373 IDEM				
SEMI-VOLATILE EXTRACTION, ACID/BASE/NEUTRAL .....	NO CHARGE			
SEMI-VOLATILE ORGANICS, RCRA .....	575.00			
PCB EXTRACTION, SLUDGE/SOIL/SEDIMENT .....	50.00			
PCB, GAS CHROMATOGRAPHY:ECD .. AROCLOR 1016 .....	50.00			
	SUBTOTAL --->	675.00	168.75	843.75
	LESS 30.0% DISCOUNT		-	253.13
	SUBTOTAL --->			590.62
SAMPLE : 102537 P.O. NO : 87-601339-11 C3374 IDEM				
SEMI-VOLATILE EXTRACTION, ACID/BASE/NEUTRAL .....	NO CHARGE			
SEMI-VOLATILE ORGANICS, RCRA .....	575.00			
PCB EXTRACTION, SLUDGE/SOIL/SEDIMENT .....	50.00			
PCB, GAS CHROMATOGRAPHY:ECD .. AROCLOR 1016 .....	50.00			
	SUBTOTAL --->	675.00	168.75	843.75
	LESS 30.0% DISCOUNT		-	253.13
	SUBTOTAL --->			590.62
SAMPLE : 102538 P.O. NO : 87-601339-11 C3375 IDEM				
SEMI-VOLATILE EXTRACTION, ACID/BASE/NEUTRAL .....	NO CHARGE			
PCB, GAS CHROMATOGRAPHY:ECD .. AROCLOR 1016 .....	50.00			
PCB EXTRACTION, WATER .....	50.00			
	SUBTOTAL --->	100.00	0.00	100.00
	LESS 30.0% DISCOUNT		-	30.00
	SUBTOTAL --->			70.00
SAMPLE : 102539 P.O. NO : 87-601339-11 C3376 IDEM				
SEMI-VOLATILE EXTRACTION, ACID/BASE/NEUTRAL .....	NO CHARGE			
PCB, GAS CHROMATOGRAPHY:ECD .. AROCLOR 1016 .....	50.00			
PCB EXTRACTION, WATER .....	50.00			
	SUBTOTAL --->	100.00	0.00	100.00
	LESS 30.0% DISCOUNT		-	30.00
	SUBTOTAL --->			70.00

EMS LABORATORIES, INC.

INVOICE NUMBER : 110915

DESCRIPTION	CHARGES	MATRIX FEES	PRIORITY PREMIUM	TOTAL
-----				
SAMPLE : 102540      P.O. NO : 87-601339-11 C3377 IDEM				
SEMI-VOLATILE EXTRACTION, ACID/BASE/NEUTRAL .....	NO CHARGE			
SEMI-VOLATILE ORGANICS, RCRA .....	575.00			
PCB, GAS CHROMATOGRAPHY:ECD ..AROCOR 1016 .....	50.00			
PCB EXTRACTION, WATER .....	50.00			
	SUBTOTAL --->	675.00	0.00	0.00
	LESS 30.0% DISCOUNT			-
	SUBTOTAL --->			675.00
				202.50
				472.50
SAMPLE : 102541      P.O. NO : 87-601339-11 C3378 IDEM				
SEMI-VOLATILE EXTRACTION, ACID/BASE/NEUTRAL .....	NO CHARGE			
SEMI-VOLATILE ORGANICS, RCRA .....	575.00			
PCB, GAS CHROMATOGRAPHY:ECD ..AROCOR 1016 .....	50.00			
PCB EXTRACTION, WATER .....	50.00			
	SUBTOTAL --->	675.00	0.00	0.00
	LESS 30.0% DISCOUNT			-
	SUBTOTAL --->			675.00
				202.50
				472.50
SAMPLE : 102542      P.O. NO : 87-601339-11 C3379 IDEM				
SEMI-VOLATILE EXTRACTION, ACID/BASE/NEUTRAL .....	NO CHARGE			
SEMI-VOLATILE ORGANICS, RCRA .....	575.00			
PCB, GAS CHROMATOGRAPHY:ECD ..AROCOR 1016 .....	50.00			
	SUBTOTAL --->	625.00	0.00	0.00
	LESS 30.0% DISCOUNT			-
	SUBTOTAL --->			625.00
				187.50
				437.50
SAMPLE : 102543      P.O. NO : 87-601339-11 C3380 IDEM				
SEMI-VOLATILE EXTRACTION, ACID/BASE/NEUTRAL .....	NO CHARGE			
SEMI-VOLATILE ORGANICS, RCRA .....	575.00			
PCB, GAS CHROMATOGRAPHY:ECD ..AROCOR 1016 .....	50.00			
	SUBTOTAL --->	625.00	0.00	0.00
	LESS 30.0% DISCOUNT			-
	SUBTOTAL --->			625.00
				187.50
				437.50
-----				
	4150.00	337.50	0.00	4487.50
		LESS DISCOUNT		-
				1346.26
		PAY THIS AMOUNT --->		3141.24

LAST PAGE

# I N V O I C E

----- CORRESPOND TO -----

INVOICE -----

EMS LABORATORIES, INC.  
7901 W. MORRIS ST.  
INDIANAPOLIS, IN 46231  
(317) 243-8305

NUMBER : 110915  
DATE : 05/31/88  
CLIENT ID : 1159

----- REMIT ONLY TO -----

EMS LABORATORIES, INC.  
P.O. BOX 66002  
INDIANAPOLIS, IN 46266

\* MINIMUM SAMPLE CHARGE \$25.00 \* NET DUE UPON RECEIPT \* 1.5% PER MONTH AFTER 30 DAYS \*

----- BILL TO -----

CARLA HATTON  
INDIANA DEPARTMENT OF ENVIRONMENTAL MGT.  
P.O. BOX 6015  
INDIANAPOLIS IN 46206-6015

----- REPORT TO -----

GREG BUSCH  
INDIANA DEPARTMENT OF ENVIRONMENTAL MGT.  
P.O. BOX 6015  
INDIANAPOLIS IN 46206-6015

DESCRIPTION	CHARGES	MATRIX FEES	PRIORITY PREMIUM	TOTAL
-----				
SAMPLE : 102536 P.O. NO : 87-601339-11 C3373 IDEM				
SEMI-VOLATILE EXTRACTION, ACID/BASE/NEUTRAL	NO CHARGE			
SEMI-VOLATILE ORGANICS, RCRA	575.00			
PCB EXTRACTION, SLUDGE/SOIL/SEDIMENT	50.00			
PCB, GAS CHROMATOGRAPHY:ECD ..AROCLOR 1016	50.00			
SUBTOTAL --->	675.00	168.75	0.00	843.75
LESS 30.0% DISCOUNT				253.13
SUBTOTAL --->				590.62
SAMPLE : 102537 P.O. NO : 87-601339-11 C3374 IDEM				
SEMI-VOLATILE EXTRACTION, ACID/BASE/NEUTRAL	NO CHARGE			
SEMI-VOLATILE ORGANICS, RCRA	575.00			
PCB EXTRACTION, SLUDGE/SOIL/SEDIMENT	50.00			
PCB, GAS CHROMATOGRAPHY:ECD ..AROCLOR 1016	50.00			
SUBTOTAL --->	675.00	168.75	0.00	843.75
LESS 30.0% DISCOUNT				253.13
SUBTOTAL --->				590.62
SAMPLE : 102538 P.O. NO : 87-601339-11 C3375 IDEM				
SEMI-VOLATILE EXTRACTION, ACID/BASE/NEUTRAL	NO CHARGE			
PCB, GAS CHROMATOGRAPHY:ECD ..AROCLOR 1016	50.00			
PCB EXTRACTION, WATER	50.00			
SUBTOTAL --->	100.00	0.00	0.00	100.00
LESS 30.0% DISCOUNT				30.00
SUBTOTAL --->				70.00
SAMPLE : 102539 P.O. NO : 87-601339-11 C3376 IDEM				
SEMI-VOLATILE EXTRACTION, ACID/BASE/NEUTRAL	NO CHARGE			
PCB, GAS CHROMATOGRAPHY:ECD ..AROCLOR 1016	50.00			
PCB EXTRACTION, WATER	50.00			
SUBTOTAL --->	100.00	0.00	0.00	100.00
LESS 30.0% DISCOUNT				30.00
SUBTOTAL --->				70.00

EMS LABORATORIES, INC.

INVOICE NUMBER : 110915

DESCRIPTION	CHARGES	MATRIX FEES	PRIORITY PREMIUM	TOTAL
-----				
SAMPLE : 102540 C3377 IDEM	P.O. NO : 87-601339-11			
SEMI-VOLATILE EXTRACTION, ACID/BASE/NEUTRAL	NO CHARGE			
SEMI-VOLATILE ORGANICS, RCRA	575.00			
PCB, GAS CHROMATOGRAPHY ECD	50.00			
PCB EXTRACTION, WATER	50.00			
	SUBTOTAL --->	675.00	0.00	0.00
	LESS 30.0% DISCOUNT			202.50
	SUBTOTAL --->			472.50
SAMPLE : 102541 C3378 IDEM	P.O. NO : 87-601339-11			
SEMI-VOLATILE EXTRACTION, ACID/BASE/NEUTRAL	NO CHARGE			
SEMI-VOLATILE ORGANICS, RCRA	575.00			
PCB, GAS CHROMATOGRAPHY ECD	50.00			
PCB EXTRACTION, WATER	50.00			
	SUBTOTAL --->	675.00	0.00	0.00
	LESS 30.0% DISCOUNT			202.50
	SUBTOTAL --->			472.50
SAMPLE : 102542 C3379 IDEM	P.O. NO : 87-601339-11			
SEMI-VOLATILE EXTRACTION, ACID/BASE/NEUTRAL	NO CHARGE			
SEMI-VOLATILE ORGANICS, RCRA	575.00			
PCB, GAS CHROMATOGRAPHY ECD	50.00			
	SUBTOTAL --->	625.00	0.00	0.00
	LESS 30.0% DISCOUNT			187.50
	SUBTOTAL --->			437.50
SAMPLE : 102543 C3380 IDEM	P.O. NO : 87-601339-11			
SEMI-VOLATILE EXTRACTION, ACID/BASE/NEUTRAL	NO CHARGE			
SEMI-VOLATILE ORGANICS, RCRA	575.00			
PCB, GAS CHROMATOGRAPHY ECD	50.00			
	SUBTOTAL --->	625.00	0.00	0.00
	LESS 30.0% DISCOUNT			187.50
	SUBTOTAL --->			437.50
=====				
	4150.00	337.50	0.00	4487.50
		LESS DISCOUNT		1346.26
		PAY THIS AMOUNT --->		3141.24

LAST PAGE



102536-  
102543

### Figure 2

# C E R T I F I C A T E   O F   A N A L Y S I S

**CORRESPOND TO**

EMS Laboratories, Inc.  
7901 West Morris Street  
Indianapolis, Indiana 46231  
(317) 243-8304

**SAMPLE**

EMS SAMPLE : 102536  
REPORT DATE : 06/01/88  
DATE RECEIVED : 05/11/88  
DATE COMPLETE : 05/31/88

**REPORT TO**

GREG BUSCH  
INDIANA DEPARTMENT OF ENVIRONMENTAL MGT.  
P.O. BOX 6015  
INDIANAPOLIS IN 46206-6015

**BILL TO**

CARLA HATTON  
INDIANA DEPARTMENT OF ENVIRONMENTAL MGT.  
P.O. BOX 6015  
INDIANAPOLIS IN 46206-6015

**DESCRIPTION**

C3373  
IDEM  
DATE SAMPLED : 5/10/88

TIME SAMPLED : 1:30 PM

TEST DESCRIPTION ANALYTE	RESULT	METHOD	DATE DET. LIMIT	ANALYST UNITS
PCB, GAS CHROMATOGRAPHY: ECD .. AROCLOR 1016 .....	SW846-8080	05/18/88	EMW	
AROCLOR 1016 .....	: ND DL: 0.20	SEE RESULT	MG/KG	
AROCLOR 1221 .....	: ND DL: 1.00			
AROCLOR 1232 .....	: ND DL: 0.20			
AROCLOR 1242 .....	: ND DL: 0.20			
AROCLOR 1248 .....	: ND DL: 0.20			
AROCLOR 1254 .....	: ND DL: 0.20			
AROCLOR 1260 .....	: ND DL: 0.20			
DBC % RECOVERY .....	: 94			
SEMI-VOLATILE ORGANICS, RCRA .....	SW846-8270	05/26/88	SHG	
SEMI-VOL (ISBH) .....	: ATTACHED	NA	NA	
FILE REFERENCE NO. .	: G1172B			
DAILY CAL CHECK FILE	: G1167B.C			
BLANK FRN .....	: G1171B.B			
SPIKE/SPIKE DUP FILE	: G1183B.M			
PCB EXTRACTION, SLUDGE/SOIL/SEDIMENT .....	SW846-3550	05/17/88	LAJ	
PCB EXT., SOIL .....	: COMPLETE	NA	NA	
SEMI-VOLATILE EXTRACTION, ACID/BASE/NEUTRAL .....	SEE SEMI-V	05/19/88	BJW	
S-VOL EXT., A/B/N ..	: COMPLETE	NA	NA	
INITIAL WT OR VOL ..	: 1G			
FINAL VOLUME, ML ...	: 1ML			

ND - Not Detected  
NA - Not Applicable

TEST DESCRIPTION ANALYTE	RESULT	METHOD	DATE DET. LIMIT	ANALYST UNITS
-----------------------------	--------	--------	--------------------	------------------

Sample was accompanied by chain of custody papers

Approved by :



The Quality Assurance Report contains information regarding the quality control (QC) which was performed during the analysis of the referenced sample. The QC includes reference standards, analytical blanks, replicate analyses, and matrix spikes. Acceptance criteria for each type of QC exist and are enforced.

The result of the analysis of an analytical reference sample, obtained from a reference sample service, is presented. Performance on these samples is determined by calculating the 'recovery' of the reference value as follows.

$$\text{PERCENT RECOVERY} = (\text{OBSERVED VALUE} / \text{REFERENCE VALUE}) * 100$$

Reference samples are tested with a minimum frequency of one per twenty non-QC samples (one per ten for organics) or one per calibration run, whichever is more frequent. The recovery information is not used to modify the reported result in any way and reference standards are not used as calibration standards.

The result of the analysis of an analytical reagent blank is also presented. Analytical blanks are analyzed with a minimum frequency of one per twenty non-QC samples or one per calibration run, whichever is more frequent. Analytical blanks are not used as calibration points and the sample results are not modified using this information.

The result of a duplicate analytical determination of a randomly selected non-QC sample is also presented. Duplicate determinations are made with a minimum frequency of one per twenty non-QC samples (one per ten for organics) or one per calibration run, whichever is more frequent. Duplicates are separately prepared (digested, extracted, etc) if necessary. Performance on duplicates is determined as follows;

$$\text{RELATIVE DIFFERENCE} = (2 * \text{abs}(A - B)) / (A + B)$$

Where A and B are the observed replicate values and must be greater than or equal to 10 times the method detection limit.

The result of the analysis of a fortified (spiked) sample is also presented. Spiked samples are randomly selected and analyzed at a minimum frequency of one per twenty non-QC samples (one per ten for organics) or one per calibration run, whichever is more frequent. Samples are fortified following any necessary preparation for metals and prior to preparation for organics. Performance on fortified samples is determined as follows;

$$\text{PERCENT SPIKE RECOVERY} = ((A - B) / C) * 100$$

where A is the observed concentration after spiking, B is the observed concentration before spiking, and C is the theoretical concentration added by the spike. Samples are spiked at 2 to 5 times the detection limit and reported in the same units as the original result.

TABLE 1. QUALITY ASSURANCE DATA TO ACCOMPANY SAMPLE 10253600.

TEST DESCRIPTION	REFERENCE STANDARD			BLANK	REPLICATES		MATRIX SPIKE			
	ACTUAL	OBSERV.	PERCENT		REP. 1	REP. 2	OBSERV. ADDED	SPIKED	PERC	
AROCLOR 1016	-	-	-	ND	-	-	-	-	-	-
AROCLOR 1221	-	-	-	ND	-	-	-	-	-	-
AROCLOR 1232	-	-	-	ND	-	-	-	-	-	-
AROCLOR 1242	-	-	-	ND	-	-	-	-	-	-
AROCLOR 1248	-	-	-	ND	-	-	-	-	-	-
AROCLOR 1254	-	-	-	ND	-	-	-	-	-	-
AROCLOR 1260	0.0025	0.0023	92	ND	-	-	0.0	0.0051	0.0047	92

**EMS LABS SEMI-VOLATILE ORGANIC ANALYSIS REPORT  
INDIANAPOLIS, INDIANA**

DESCRIPTION : IDEM C3373

EMS SAMPLE# : 102536  
ANALYSIS METHOD: SW-846 Method 8270

DATA FILE: >1172B:B4  
ANALYSIS TIME: 5/26/88 20:36

	<u>BASE-NEUTRAL</u>	<u>RESULTS (MG/KG)</u>
1	Acenaphthene	ND
2	Acenaphthylene	ND
3	Aniline	ND
4	Anthracene	ND
5	Benzidine	ND
6	Benz(a)anthracene	ND
7	Benzo(a)pyrene	ND
8	Benzo(b)fluoranthene	ND
9 *	Benzo(ghi)perylene	ND
10	Benzo(k)fluoranthene	ND
11	Benzyl alcohol	ND
12	Benzylbutylphthalate	ND
13	Bis(2-chloroethoxy)methane	ND
14	Bis(2-chloroethyl)ether	ND
15	Bis(2-chloroisopropyl)ether	ND
16	Bis(2-ethylhexyl)phthalate	ND
17	4-Bromophenylphenylether	ND
18	Carbazole	ND
19	4-Chloroaniline	ND
20	2-Chloronaphthalene	ND
21	4-Chlorophenylphenylether	ND
22	Chrysene	ND
23 *	Dibenz(a,h)anthracene	ND
24	Dibenzofuran	ND
25	1,2-Dichlorobenzene	ND
26	1,3-Dichlorobenzene	ND
27	1,4-Dichlorobenzene	ND
28	3,3'-Dichlorobenzidine	ND
29	Diethylphthalate	ND
30	Dimethylphthalate	ND
31	Di-n-butylphthalate	16. ND
32	Dinitrobenzene	ND
33	2,4-Dinitrotoluene	ND
34	2,6-Dinitrotoluene	ND
35	Di-n-octylphthalate	ND
36	Diphenyl hydrazine	ND
37	Fluoranthene	ND
38	Fluorene	ND
39	Hexachlorobenzene	ND
40	Hexachlorobutadiene	ND
41	Hexachlorocyclopentadiene	ND
42	Hexachloroethane	ND
43 *	Indeno(1,2,3-cd)pyrene	ND
44	Isophorone	ND
45	2-Methylnaphthalene	ND
46	Naphthalene	ND
47	2-Nitroaniline	ND
48	3-Nitroaniline	ND
49	4-Nitroaniline	ND
50	Nitrobenzene	ND

DESCRIPTION : IDEM C3373

EMS SAMPLE# : 102536

DATA FILE: &gt;1172B::B4

51		N-nitrosodiphenylamine	ND
52		N-nitroso-dipropyl-amine	ND
53		Phenanthrene	ND
54	**	2-Picoline	ND
55		Pyrene	ND
56	**	Pyridine	ND
57		Tetrachlorobenzenes	ND
58		Toluenediamine	ND
59		1,2,4-Trichlorobenzene	ND

ACID

1	*	Benzoic acid	ND
2	*	2-Chlorophenol	ND
3	*	2,4-Dichlorophenol	ND
4	*	2,4-Dimethylphenol	ND
5	**	4,6-Dinitro-2-methylphenol	ND
6	**	2,4-Dinitrophenol	ND
7	*	2-Methylphenol	ND
8	*	4-Methylphenol	ND
9	*	2-Nitrophenol	ND
10	*	4-Nitrophenol	ND
11	*	4-Chloro-3-Methylphenol	ND
12	*	Pentachlorophenol	ND
13	*	Phenol	ND
14	*	Tetrachlorophenol	ND
15	*	2,4,5-Trichlorophenol	ND
16	*	2,4,6-Trichlorophenol	ND

PESTICIDES

1		Aldrin	ND
2		alpha-BHC	ND
3		alpha-Endosulfan	ND
4		beta-BHC	ND
5		beta-Endosulfan	ND
6	**	Chlordane	ND
7		p,p'-DDD	ND
8		p,p'-DDE	ND
9		p,p'-DDT	ND
10		delta-BHC	ND
11		Dieldrin	ND
12		Endosulfan sulfate	ND
13		Endrin	ND
14		Endrin aldehyde	ND
15		gamma-BHC (Lindane)	ND
16		Heptachlor	ND
17		Heptachlor epoxide	ND
18		Methoxychlor	ND
19	**	PCB-1016	ND
20	**	PCB-1242	ND
21	**	PBC-1248	ND
22	**	PCB-1254	ND
23	**	PCB-1260	ND
24	**	Toxaphene	ND

DESCRIPTION : IDEM C3373

EMS SAMPLE# : 102536

DATA FILE: &gt;1172B::B4

Surrogate Recovery (Phenols @ 100 MG/KG, BN @ 50 MG/KG)

1	2-Fluorophenol	73 %
2	Phenol-d5	76 %
3	Nitrobenzene-d5	82 %
4	2-Fluorobiphenyl	75 %
5	2,4,6-Tribromophenol	90 %
6	Terphenyl-d14	88 %

Detection Limits (MG/KG): 10

\* Detection Limits (MG/KG): 25

\*\* Detection Limits (MG/KG): 50

( ) Estimated Concentration below Detection Limit.

Other compounds identified

UNKNOWN : R.T. - 2.01, 21.75, 31.16

ETHYL HEXANOL

UNKNOWN PHTHALATE : R.T.- 23.97

MOL. SULFUR

Dilution Factor 1



Continuing Calibration Check  
HSL Compounds

Case No: _____	Calibration Date: 05/26/88
Contractor: EMS LABS	Time: 15:55
Contract No: _____	Laboratory ID: >1167B
Instrument ID: GC/MS 2	Initial Calibration Date: 05/12/88

Minimum  $\overline{RF}$  for SPCC is 0.050

Maximum % Diff for CCC is 25.0%

Compound	$\overline{RF}$	RF	%Diff	CCC	SPCC
Pyridine	1.65406	-	-		
N-nitroso-dimethyl-amine	.70898	-	-		
2-Picoline	1.02734	-	-		
2-Fluorophenol (surr)	1.05706	1.20013	13.53		
Phenol-d5 (surr)	1.15282	1.37815	19.55		
Aniline	2.06136	2.27501	10.36		
Bis(2-chloroethyl)ether	1.48072	1.71712	15.97		
1,3-Dichlorobenzene	1.65970	1.62351	2.18		
2-Chlorophenol	1.43752	1.66994	16.17		
1,4-Dichlorobenzene	1.68630	1.69803	.70	*	
1,2-Dichlorobenzene	1.62139	1.58894	2.00		
Phenol	1.56304	1.95237	24.91	*	
Benzyl alcohol	1.05883	.89446	15.52		
Bis(2-chloroisopropyl)ether	.83039	.83463	.51		
2-Methylphenol	1.18799	1.18646	.13		
4-Methylphenol	1.25483	1.26869	1.10		
Hexachloroethane	.73730	.66198	10.22		
N-Nitroso-dipropyl-amine	.84810	.79633	6.10		**
Nitrobenzene	.55824	.36644	34.36	—	
Isophorone	.88065	.68867	21.80		
2-Nitrophenol	.25233	.23448	7.07	*	
Nitrobenzene-d5 (surr)	.49646	.35866	27.76	—	
Bis(2-chloroethoxy)methane	.49257	.52188	5.95		
1,2,4-Trichlorobenzene	.38989	.33810	13.28		
Naphthalene	1.15193	1.07380	6.78		
2,4-Dimethylphenol	.37415	.35860	4.16		
2,4-Dichlorophenol	.33328	.31625	5.11	*	
4-Chloroaniline	.53766	.46456	13.60		
Hexachlorobutadiene	.22136	.18008	18.65	*	
Benzoic acid	.23087	.08312	64.00	—	
2-Methylnaphthalene	.80654	.67991	15.70		
1,2,3,4-Tetrachlorobenzene	.63560	-	-		

RF - Response Factor from daily standard file at 50.00 ppb

$\overline{RF}$  - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (\*) SPCC - System Performance Check Compounds (\*\*)

Continuing Calibration Check  
HSL Compounds

Case No: _____	Calibration Date: 05/26/88
Contractor: EMS LABS	Time: 15:55
Contract No: _____	Laboratory ID: >1167B
Instrument ID: GC/MS 2	Initial Calibration Date: 05/12/88

Minimum  $\overline{RF}$  for SPCC is 0.050

Maximum % Diff for CCC is 25.0%

Compound	$\overline{RF}$	RF	%Diff	CCC	SPCC
Hexachlorocyclopentadiene	.40906	.41575	1.63		**
1,2,4,5-Tetrachlorobenzene	.19371	-	-		
4-Chloro-3-Methylphenol	.59990	.73089	21.84	*	
2-Fluorobiphenyl (surr)	1.64506	1.58432	3.69		
2-Chloronaphthalene	1.34058	1.42358	6.19		
Toluenediamine	.33468	-	-		
2,4,6-Trichlorophenol	.42205	.41375	1.97	*	
2,4,5-Trichlorophenol	.42531	.39462	7.22		
2-Nitroaniline	.40002	.30673	23.32		
Acenaphthylene	1.94862	1.93691	.60		
1,3-Dinitrobenzene	.26671	-	-		
Dimethylphthalate	1.22016	1.28192	5.06		
2,6-Dinitrotoluene	.32161	.34689	7.86		
Acenaphthene	1.30130	1.20516	7.39	*	
3-Nitroaniline	.33950	.33155	2.34		
Dibenzofuran	1.82502	1.81285	.67		
2,4-Dinitrophenol	.14488	.05767	60.19	-	**
2,4-Dinitrotoluene	.39283	.37048	5.69		
2,3,4,6-Tetrachlorophenol	-	-	-		
Fluorene	1.30827	1.18000	9.80		
4-Chlorophenylphenylether	.61037	.54784	10.24		
Isopropyl-biphenyl (1)	.37707	-	-		
4-Nitrophenol	.23143	.23694	2.38		**
Diethylphthalate	1.15164	1.03784	9.88		
2,4,6-Tribromophenol (surr)	.18864	.14578	22.72		
Diphenyl hydrazine	-	-	-		
4,6-Dinitro-2-methylphenol	.14450	.10861	24.84		
N-Nitrosodiphenylamine	.56217	.64104	14.03	*	
4-Nitroaniline	.18293	.27454	50.08		
Isopropyl-biphenyl (2)	.20005	-	-		
4-Bromophenylphenylether	.28139	.28516	1.34		
Chlorodibenzofuran	.56763	-	-		

RF - Response Factor from daily standard file at 50.00 ppb

$\overline{RF}$  - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (\*) SPCC - System Performance Check Compounds (\*\*)

Continuing Calibration Check  
HSL Compounds

Case No: _____	Calibration Date: 05/26/88
Contractor: EMS LABS	Time: 15:55
Contract No: _____	Laboratory ID: >1167B
Instrument ID: GC/MS 2	Initial Calibration Date: 05/12/88

Minimum  $\overline{RF}$  for SPCC is 0.050

Maximum % Diff for CCC is 25.0%

Compound	$\overline{RF}$	RF	%Diff	CCC	SPCC
alpha-BHC	.15970	.13748	13.91		
Hexachlorobenzene	.31956	.31905	.16		
beta-BHC	.09148	-	-		
gamma-BHC (Lindane)	.09195	.12563	36.62	+	
Phenanthrene	1.11149	1.11219	.06		
Anthracene	1.06632	1.03011	3.40		
Pentachlorophenol	.11522	.09874	14.30	*	
delta-BHC	.09700	-	-		
Carbazole	1.81069	-	-		
Dichlorodibenzofuran	.45594	-	-		
Heptachlor	.17923	.13826	22.86		
Aldrin	.16051	.12206	23.95		
Di-n-butylphthalate	1.36368	1.13501	16.77		
Arochlor-1016	-	-	-		
Arochlor-1221	-	-	-		
Arochlor-1232	-	-	-		
Arochlor-1242	-	-	-		
Arochlor-1254	-	-	-		
Arochlor-1260	-	-	-		
Chlordane	-	-	-		
Toxaphene	-	-	-		
Heptachlor epoxide	.16798	-	-		
Fluoranthene	1.69726	1.61443	4.88	*	
Pyrene	1.72806	1.59763	7.55		
alpha-Endosulfan	.04992	.03629	27.29	-	
Benzidine	.23743	.21357	10.05		
Dieldrin	.30523	.24243	20.57		
p,p'-DDE	.31447	.28216	10.28		
Endrin	.10156	-	-		
beta-Endosulfan	.04971	.02992	39.81	-	
p,p'-DDD	.54822	.47362	13.61		
Endrin aldehyde	.04026	-	-		

RF - Response Factor from daily standard file at 50.00 ppb  
 RF - Average Response Factor from Initial Calibration Form VI  
 %Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (\*) SPCC - System Performance Check Compounds (\*\*)

Continuing Calibration Check  
HSL Compounds

Case No: _____	Calibration Date: 05/26/88
Contractor: EMS LABS	Time: 15:55
Contract No: _____	Laboratory ID: >1167B
Instrument ID: GC/MS 2	Initial Calibration Date: 05/12/88

Minimum  $\overline{RF}$  for SPCC is 0.050

Maximum % Diff for CCC is 25.0%

Compound	$\overline{RF}$	RF	%Diff	CCC SPCC
Endosulfan sulfate	.10106	-	-	
2,3,7,8-TCDD	-	-	-	
p,p'-DDT	.48317	.35356	26.83	-
Benzylbutylphthalate	.89621	.64246	28.31	-
Benz(a)anthracene	1.53767	1.16880	23.99	
Chrysene	1.30073	1.22196	6.06	
3,3'-Dichlorobenzidine	.37766	.26504	29.82	-
Methoxychlor	-	-	-	
Terphenyl-d14 (surr)	1.45540	1.10171	24.30	
Bis(2-ethylhexyl)phthalate	1.33278	.76008	42.97	-
Di-n-octylphthalate	2.76059	2.36699	14.26	*
Benzo(b)fluoranthene	1.49855	.95218	36.46	-
Benzo(k)fluoranthene	1.31154	1.19710	8.73	
Benzo(a)pyrene	1.14798	.92452	19.47	*
Indeno(1,2,3-cd)pyrene	.63228	.75060	18.71	
Dibenz(a,h)anthracene	.62884	.69579	10.65	
Benzo(ghi)perylene	.61981	.77701	25.36	+

RF ~ Response Factor from daily standard file at 50.00 ppb  
 RF ~ Average Response Factor from Initial Calibration Form VI  
 %Diff ~ % Difference from original average or curve

CCC ~ Calibration Check Compounds (\*) SPCC ~ System Performance Check Compounds (\*\*)

**EMS LABS SEMI-VOLATILE ORGANIC ANALYSIS REPORT  
INDIANAPOLIS, INDIANA**

DESCRIPTION : SOIL BLANK

EMS SAMPLE# : BNA-SMB  
ANALYSIS METHOD: SW-846 Method 8270

DATA FILE: >1171B::B4  
ANALYSIS TIME: 5/26/88 19:40

	<u>BASE-NEUTRAL</u>	<u>RESULTS (MG/KG)</u>
1	Acenaphthene	ND
2	Acenaphthylene	ND
3	Aniline	ND
4	Anthracene	ND
5	Benzidine	ND
6	Benz(a)anthracene	ND
7	Benzo(a)pyrene	ND
8	Benzo(b)fluoranthene	ND
9 *	Benzo(ghi)perylene	ND
10	Benzo(k)fluoranthene	ND
11	Benzyl alcohol	ND
12	Benzylbutylphthalate	ND
13	Bis(2-chloroethoxy)methane	ND
14	Bis(2-chloroethyl)ether	ND
15	Bis(2-chloroisopropyl)ether	ND
16	Bis(2-ethylhexyl)phthalate	ND
17	4-Bromophenylphenylether	ND
18	Carbazole	ND
19	4-Chloroaniline	ND
20	2-Chloronaphthalene	ND
21	4-Chlorophenylphenylether	ND
22	Chrysene	ND
23 *	Dibenz(a,h)anthracene	ND
24	Dibenzofuran	ND
25	1,2-Dichlorobenzene	ND
26	1,3-Dichlorobenzene	ND
27	1,4-Dichlorobenzene	ND
28	3,3'-Dichlorobenzidine	ND
29	Diethylphthalate	ND
30	Dimethylphthalate	ND
31	Di-n-butylphthalate	(9.)
32	Dinitrobenzene	ND
33	2,4-Dinitrotoluene	ND
34	2,6-Dinitrotoluene	ND
35	Di-n-octylphthalate	ND
36	Diphenyl hydrazine	ND
37	Fluoranthene	ND
38	Fluorene	ND
39	Hexachlorobenzene	ND
40	Hexachlorobutadiene	ND
41	Hexachlorocyclopentadiene	ND
42	Hexachloroethane	ND
43 *	Indeno(1,2,3-cd)pyrene	ND
44	Isophorone	ND
45	2-Methylnaphthalene	ND
46	Naphthalene	ND
47	2-Nitroaniline	ND
48	3-Nitroaniline	ND
49	4-Nitroaniline	ND
50	Nitrobenzene	ND

DESCRIPTION : SOIL BLANK

EMS SAMPLE# : BNA-SMB

DATA FILE: &gt;1171B::B4

51		N-nitrosodiphenylamine	ND
52		N-nitroso-dipropyl-amine	ND
53		Phenanthrene	ND
54	**	2-Picoline	ND
55		Pyrene	ND
56	**	Pyridine	ND
57		Tetrachlorobenzenes	ND
58		Toluenediamine	ND
59		1,2,4-Trichlorobenzene	ND

ACID

1	*	Benzoic acid	ND
2	*	2-Chlorophenol	ND
3	*	2,4-Dichlorophenol	ND
4	*	2,4-Dimethylphenol	ND
5	**	4,6-Dinitro-2-methylphenol	ND
6	**	2,4-Dinitrophenol	ND
7	*	2-Methylphenol	ND
8	*	4-Methylphenol	ND
9	*	2-Nitrophenol	ND
10	*	4-Nitrophenol	ND
11	*	4-Chloro-3-Methylphenol	ND
12	*	Pentachlorophenol	ND
13	*	Phenol	ND
14	*	Tetrachlorophenol	ND
15	*	2,4,5-Trichlorophenol	ND
16	*	2,4,6-Trichlorophenol	ND

PESTICIDES

1		Aldrin	ND
2		alpha-BHC	ND
3		alpha-Endosulfan	ND
4		beta-BHC	ND
5		beta-Endosulfan	ND
6	**	Chlordane	ND
7		p,p'-DDD	ND
8		p,p'-DDE	ND
9		p,p'-DDT	ND
10		delta-BHC	ND
11		Dieldrin	ND
12		Endosulfan sulfate	ND
13		Endrin	ND
14		Endrin aldehyde	ND
15		gamma-BHC (Lindane)	ND
16		Heptachlor	ND
17		Heptachlor epoxide	ND
18		Methoxychlor	ND
19	**	PCB-1016	ND
20	**	PCB-1242	ND
21	**	PBC-1248	ND
22	**	PCB-1254	ND
23	**	PCB-1260	ND
24	**	Toxaphene	ND

DESCRIPTION : SOIL BLANK

EMS SAMPLE# : BNA-SMB

DATA FILE: &gt;1171B::B4

Surrogate Recovery (Phenols @ 100 MG/KG, BN @ 50 MG/KG)

1	2-Fluorophenol	73	%
2	Phenol-d5	78	%
3	Nitrobenzene-d5	79	%
4	2-Fluorobiphenyl	73	%
5	2,4,6-Tribromophenol	74	%
6	Terphenyl-d14	104	%

Detection Limits (MG/KG): 10

\* Detection Limits (MG/KG): 25

\*\* Detection Limits (MG/KG): 50

( ) Estimated Concentration below Detection Limit.

Other compounds identified

UNKNOWN : R.T. - 2.04, 7.22, 31.18

ETHYL HEXANOL

UNKNOWN PHTHALATE R.T.- 23.98

Dilution Factor 1

# SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name : EMS LABORATORIES

EMS Sample No. : CLP MS/MSD

MS DATA FILE : >1183B

MSD DATA FILE : >1184B

ANALYSIS METHOD: SW-846 Method 8270

ANALYSIS TIME: 5/27/88

COMPOUND	SPIKE ADDED (MG/KG)	SAMPLE CONCENTRATION (MG/KG)	MS CONCENTRATION (MG/KG)	MS % REC	QC LIMITS REC.
Phenol	20.	0	6.7	34	26- 90
2-Chlorophenol	20.	0	10.5	52	25-102
1,4-Dichlorobenzene	10.	0	6.4	64	28-104
N-Nitroso-dipropylamine	10.	0	9.5	95	41-126
1,2,4-Trichlorobenzene	10.	0	5.5	55	38-107
4-Chloro-3-Methylphenol	20.	0	10.3	51	26-103
Acenaphthene	10.	0	7.2	72	31-137
4-Nitrophenol	20.	0	8.3	41	11-114
2,4-Dinitrotoluene	10.	0	12.1	121 *	28- 89
Pentachlorophenol	20.	0	12.4	62	17-109
Pyrene	10.	0	13.1	131	35-142

COMPOUND	SPIKE ADDED (MG/KG)	MSD CONC. (MG/KG)	MSD % REC	#	% RPD	#	QC LIMITS RPD	REC.
Phenol	20.	6.2	31		9.		35	26- 90
2-Chlorophenol	20.	9.4	47		10.		50	25-102
1,4-Dichlorobenzene	10.	5.7	57		11.		27	28-104
N-Nitroso-dipropylamine	10.	9.1	91		4.		38	41-126
1,2,4-Trichlorobenzene	10.	5.0	50		10.		23	38-107
4-Chloro-3-Methylphenol	20.	10.2	51		0.		33	26-103
Acenaphthene	10.	6.8	68		6.		19	31-137
4-Nitrophenol	20.	5.7	29		34.		50	11-114
2,4-Dinitrotoluene	10.	10.6	106 *		13.		47	28- 89
Pentachlorophenol	20.	11.2	56		10.		47	17-109
Pyrene	10.	11.8	118		10.		36	35-142

# Column to be used to flag recovery and RPD values with an asterisk

\* Values outside of QC limits

RPD: 0 outside of QC limits

Spike Recovery: 2 outside of QC limits

Comments:



# C E R T I F I C A T E   O F   A N A L Y S I S

## CORRESPOND TO

EMS Laboratories, Inc.  
7901 West Morris Street  
Indianapolis, Indiana 46231  
(317) 243-8304

## SAMPLE

EMS SAMPLE : 102537  
REPORT DATE : 06/01/88  
DATE RECEIVED : 05/11/88  
DATE COMPLETE : 05/31/88

## REPORT TO

GREG BUSCH  
INDIANA DEPARTMENT OF ENVIRONMENTAL MGT.  
P.O. BOX 6015  
INDIANAPOLIS IN 46206-6015

## BILL TO

CARLA HATTON  
INDIANA DEPARTMENT OF ENVIRONMENTAL MGT.  
P.O. BOX 6015  
INDIANAPOLIS IN 46206-6015

## DESCRIPTION

C3374  
IDEM  
DATE SAMPLED : 5/10/88

TIME SAMPLED : 1:45 PM

TEST DESCRIPTION ANALYTE	RESULT	METHOD	DATE DET. LIMIT	ANALYST UNITS
PCB, GAS CHROMATOGRAPHY: ECD .. AROCLOR 1016 .....	SW846-8080	05/18/88	EMW	
AROCLOR 1016 .....	: ND DL: 0.20	SEE RESULT	MG/KG	
AROCLOR 1221 .....	: ND DL: 1.00			
AROCLOR 1232 .....	: ND DL: 0.20			
AROCLOR 1242 .....	: ND DL: 0.20			
AROCLOR 1248 .....	: ND DL: 0.20			
AROCLOR 1254 .....	: ND DL: 0.20			
AROCLOR 1260 .....	: ND DL: 0.20			
DBC % RECOVERY .....	: 93			
SEMI-VOLATILE ORGANICS, RCRA .....	SW846-8270	05/26/88	SHG	
SEMI-VOL (ISBH) .....	: ATTACHED	NA	NA	
FILE REFERENCE NO. .	: G1173B			
DAILY CAL CHECK FILE	: G1167B.C			
BLANK FRN .....	: G1171B.B			
SPIKE/SPIKE DUP FILE	: G1183B.M			
PCB EXTRACTION, SLUDGE/SOIL/SEDIMENT .....	SW846-3550	05/17/88	LAJ	
PCB EXT., SOIL .....	: COMPLETE	NA	NA	
SEMI-VOLATILE EXTRACTION, ACID/BASE/NEUTRAL .....	SEE SEMI-V	05/19/88	BJW	
S-VOL EXT., A/B/N ..	: COMPLETE	NA	NA	
INITIAL WT OR VOL ..	: 1G			
FINAL VOLUME, ML ...	: 1ML			

ND - Not Detected  
NA - Not Applicable

EMS LABS SEMI-VOLATILE ORGANIC ANALYSIS REPORT  
INDIANAPOLIS, INDIANA

DESCRIPTION : IDEM C3374

EMS SAMPLE# : 102537  
ANALYSIS METHOD: SW-846 Method 8270

DATA FILE: >1173B::B4  
ANALYSIS TIME: 5/26/88 21:31

	<u>BASE-NEUTRAL</u>	<u>RESULTS (MG/KG)</u>
1	Acenaphthene	ND
2	Acenaphthylene	ND
3	Aniline	ND
4	Anthracene	ND
5	Benzidine	ND
6	Benz(a)anthracene	ND
7	Benzo(a)pyrene	ND
8	Benzo(b)fluoranthene	ND
9 *	Benzo(ghi)perylene	ND
10	Benzo(k)fluoranthene	ND
11	Benzyl alcohol	ND
12	Benzylbutylphthalate	ND
13	Bis(2-chloroethoxy)methane	ND
14	Bis(2-chloroethyl)ether	ND
15	Bis(2-chloroisopropyl)ether	ND
16	Bis(2-ethylhexyl)phthalate	ND
17	4-Bromophenylphenylether	ND
18	Carbazole	ND
19	4-Chloroaniline	ND
20	2-Chloronaphthalene	ND
21	4-Chlorophenylphenylether	ND
22	Chrysene	ND
23 *	Dibenz(a,h)anthracene	ND
24	Dibenzofuran	ND
25	1,2-Dichlorobenzene	ND
26	1,3-Dichlorobenzene	ND
27	1,4-Dichlorobenzene	ND
28	3,3'-Dichlorobenzidine	ND
29	Diethylphthalate	ND
30	Dimethylphthalate	ND
31	Di-n-butylphthalate	(6.)
32	Dinitrobenzene	ND
33	2,4-Dinitrotoluene	ND
34	2,6-Dinitrotoluene	ND
35	Di-n-octylphthalate	ND
36	Diphenyl hydrazine	ND
37	Fluoranthene	ND
38	Fluorene	ND
39	Hexachlorobenzene	ND
40	Hexachlorobutadiene	ND
41	Hexachlorocyclopentadiene	ND
42	Hexachloroethane	ND
43 *	Indeno(1,2,3-cd)pyrene	ND
44	Isophorone	ND
45	2-Methylnaphthalene	ND
46	Naphthalene	ND
47	2-Nitroaniline	ND
48	3-Nitroaniline	ND
49	4-Nitroaniline	ND
50	Nitrobenzene	ND

DESCRIPTION : IDEM C3374

EMS SAMPLE# : 102537

DATA FILE: &gt;1173B::B4

51		N-nitrosodiphenylamine	ND
52		N-nitroso-dipropyl-amine	ND
53		Phenanthrene	ND
54	**	2-Picoline	ND
55		Pyrene	ND
56	**	Pyridine	ND
57		Tetrachlorobenzenes	ND
58		Toluenediamine	ND
59		1,2,4-Trichlorobenzene	ND

ACID

1	*	Benzoic acid	ND
2	*	2-Chlorophenol	ND
3	*	2,4-Dichlorophenol	ND
4	*	2,4-Dimethylphenol	ND
5	**	4,6-Dinitro-2-methylphenol	ND
6	**	2,4-Dinitrophenol	ND
7	*	2-Methylphenol	ND
8	*	4-Methylphenol	ND
9	*	2-Nitrophenol	ND
10	*	4-Nitrophenol	ND
11	*	4-Chloro-3-Methylphenol	ND
12	*	Pentachlorophenol	ND
13	*	Phenol	ND
14	*	Tetrachlorophenol	ND
15	*	2,4,5-Trichlorophenol	ND
16	*	2,4,6-Trichlorophenol	ND

PESTICIDES

1		Aldrin	ND
2		alpha-BHC	ND
3		alpha-Endosulfan	ND
4		beta-BHC	ND
5		beta-Endosulfan	ND
6	**	Chlordane	ND
7		p,p'-DDD	ND
8		p,p'-DDE	ND
9		p,p'-DDT	ND
10		delta-BHC	ND
11		Dieldrin	ND
12		Endosulfan sulfate	ND
13		Endrin	ND
14		Endrin aldehyde	ND
15		gamma-BHC (Lindane)	ND
16		Heptachlor	ND
17		Heptachlor epoxide	ND
18		Methoxychlor	ND
19	**	PCB-1016	ND
20	**	PCB-1242	ND
21	**	PBC-1248	ND
22	**	PCB-1254	ND
23	**	PCB-1260	ND
24	**	Toxaphene	ND

DESCRIPTION : IDEM C3374

EMS SAMPLE# : 102537

DATA FILE: &gt;1173B::B4

Surrogate Recovery (Phenols @ 100 MG/KG, BN @ 50 MG/KG)

1	2-Fluorophenol	37	%
2	Phenol-d5	39	%
3	Nitrobenzene-d5	40	%
4	2-Fluorobiphenyl	33	%
5	2,4,6-Tribromophenol	35	%
6	Terphenyl-d14	44	%

Detection Limits (MG/KG): 10

\* Detection Limits (MG/KG): 25

\*\* Detection Limits (MG/KG): 50

( ) Estimated Concentration below Detection Limit.

Other compounds identified

ETHYL HEXANOL

MOL. SULFUR

UNKNOWN PHTHALATE R.T- 23.97

UNKNOWN R.T.- 31.20

Dilution Factor 1

# C E R T I F I C A T E   O F   A N A L Y S I S

----- CORRESPOND TO -----

SAMPLE -----

EMS Laboratories, Inc.  
7901 West Morris Street  
Indianapolis, Indiana 46231  
(317) 243-8304

EMS SAMPLE : 102538  
REPORT DATE : 05/25/88  
DATE RECEIVED : 05/11/88  
DATE COMPLETE : 05/19/88

----- REPORT TO -----

BILL TO -----

GREG BUSCH  
INDIANA DEPARTMENT OF ENVIRONMENTAL MGT.  
P.O. BOX 6015  
INDIANAPOLIS IN 46206-6015

CARLA HATTON  
INDIANA DEPARTMENT OF ENVIRONMENTAL MGT.  
P.O. BOX 6015  
INDIANAPOLIS IN 46206-6015

## ----- DESCRIPTION -----

C3375  
IDEM

DATE SAMPLED : 5/10/88

TIME SAMPLED : 2:15 PM

TEST DESCRIPTION  
ANALYTE

RESULT

METHOD

DATE  
DET. LIMIT

ANALYST  
UNITS

PCB, GAS CHROMATOGRAPHY:ECD ..AROCLOR 1016 .....SW846-8080  
AROCLOR 1016 ..... : ND DL: 0.0001  
AROCLOR 1221 ..... : ND DL: 0.0005  
AROCLOR 1232 ..... : ND DL: 0.0001  
AROCLOR 1242 ..... : ND DL: 0.0001  
AROCLOR 1248 ..... : ND DL: 0.0001  
AROCLOR 1254 ..... : 0.000082 DL: 0.00008  
AROCLOR 1260 ..... : 0.00011 DL: 0.00008  
DBC % RECOVERY ..... : 98

05/18/88  
SEE RESULT  
EMW  
MG/L

PCB EXTRACTION, WATER .....SW846-3510  
PCB EXT., WATER .... : COMPLETE

05/16/88  
NA  
LAJ

SEMI-VOLATILE EXTRACTION, ACID/BASE/NEUTRAL .....SEE SEMI-V  
S-VOL EXT., A/B/N .. : COMPLETE  
INITIAL WT OR VOL .. : 1L  
FINAL VOLUME, ML ... : 1ML

05/13/88  
NA  
BJW  
NA

ND - Not Detected

NA - Not Applicable

Sample was accompanied by chain of custody papers

Approved by :



Page 1 of 1

# C E R T I F I C A T E   O F   A N A L Y S I S

----- CORRESPOND TO -----

----- SAMPLE -----

EMS Laboratories, Inc.  
7901 West Morris Street  
Indianapolis, Indiana 46231  
(317) 243-8304

EMS SAMPLE : 102539  
REPORT DATE : 05/25/88  
DATE RECEIVED : 05/11/88  
DATE COMPLETE : 05/19/88

----- REPORT TO -----

----- BILL TO -----

GREG BUSCH  
INDIANA DEPARTMENT OF ENVIRONMENTAL MGT.  
P.O. BOX 6015  
INDIANAPOLIS IN 46206-6015

CARLA HATTON  
INDIANA DEPARTMENT OF ENVIRONMENTAL MGT.  
P.O. BOX 6015  
INDIANAPOLIS IN 46206-6015

## ----- DESCRIPTION -----

C3376

IDEM

DATE SAMPLED : 5/10/88

TIME SAMPLED : 2:25 PM

TEST DESCRIPTION ANALYTE	RESULT	METHOD	DATE DET. LIMIT	ANALYST UNITS
PCB, GAS CHROMATOGRAPHY:ECD ..AROCLOR 1016 .....	SW846-8080	05/18/88	EMW	
AROCLOR 1016 .....	ND	DL: 0.0001	SEE RESULT	MG/L
AROCLOR 1221 .....	ND	DL: 0.0005		
AROCLOR 1232 .....	ND	DL: 0.0001		
AROCLOR 1242 .....	ND	DL: 0.0001		
AROCLOR 1248 .....	ND	DL: 0.0001		
AROCLOR 1254 .....	0.00014	DL: 0.0001		
AROCLOR 1260 .....	0.00018	DL: 0.0001		
DBC % RECOVERY .....	102			
PCB EXTRACTION, WATER .....	SW846-3510	05/16/88	LAJ	
PCB EXT., WATER ....	COMPLETE	NA		
SEMI-VOLATILE EXTRACTION, ACID/BASE/NEUTRAL .....	SEE SEMI-V	05/13/88	BJW	
S-VOL EXT., A/B/N ..	COMPLETE	NA	NA	
INITIAL WT OR VOL ..	1L			
FINAL VOLUME, ML ...	1ML			

ND - Not Detected

NA - Not Applicable

Sample was accompanied by chain of custody papers

Approved by :

*DPeterson*

Page 1 of 1

# C E R T I F I C A T E   O F   A N A L Y S I S

----- CORRESPOND TO -----

SAMPLE -----

EMS Laboratories, Inc.  
7901 West Morris Street  
Indianapolis, Indiana 46231  
(317) 243-8304

EMS SAMPLE : 102540  
REPORT DATE : 05/25/88  
DATE RECEIVED : 05/11/88  
DATE COMPLETE : 05/24/88

----- REPORT TO -----

BILL TO -----

GREG BUSCH  
INDIANA DEPARTMENT OF ENVIRONMENTAL MGT.  
P.O. BOX 6015  
INDIANAPOLIS IN 46206-6015

CARLA HATTON  
INDIANA DEPARTMENT OF ENVIRONMENTAL MGT.  
P.O. BOX 6015  
INDIANAPOLIS IN 46206-6015

## ----- DESCRIPTION -----

C3377  
IDEM

DATE SAMPLED : 5/10/88

TIME SAMPLED : 2:30 PM

TEST DESCRIPTION ANALYTE	RESULT	METHOD	DATE DET. LIMIT	ANALYST UNITS
PCB, GAS CHROMATOGRAPHY: ECD .. AROCLOR 1016 .....	SW846-8080	05/18/88	EMW	
AROCLOR 1016 .....	: ND DL: 0.0001	SEE RESULT	MG/L	
AROCLOR 1221 .....	: ND DL: 0.0005			
AROCLOR 1232 .....	: ND DL: 0.0001			
AROCLOR 1242 .....	: ND DL: 0.0001			
AROCLOR 1248 .....	: ND DL: 0.0001			
AROCLOR 1254 .....	: ND DL: 0.0001			
AROCLOR 1260 .....	: ND DL: 0.0001			
DBC % RECOVERY .....	: 101			
SEMI-VOLATILE ORGANICS, RCRA .....	SW846-8270	05/17/88	SHG	
SEMI-VOL (ISBH) .....	: ATTACHED	NA	NA	
FILE REFERENCE NO. .	: G1073B			
DAILY CAL CHECK FILE	: G1071B.C			
BLANK FRN .....	: G1072B.B			
SPIKE/SPIKE DUP FILE	: G1095B.M			
EXTRACTED STANDARD .	: NA			
PCB EXTRACTION, WATER .....	SW846-3510	05/16/88	LAJ	
PCB EXT., WATER ....	: COMPLETE	NA		
SEMI-VOLATILE EXTRACTION, ACID/BASE/NEUTRAL .....	SEE SEMI-V	05/16/88	RKB	
S-VOL EXT., A/B/N ..	: COMPLETE	NA	NA	
INITIAL WT OR VOL ..	: 1L			
FINAL VOLUME, ML ...	: 1ML			

ND - Not Detected

**EMS LABS SEMI-VOLATILE ORGANIC ANALYSIS REPORT  
INDIANAPOLIS, INDIANA**

DESCRIPTION : IDEM C3377

EMS SAMPLE# : 102540  
ANALYSIS METHOD: SW-846 Method 8270

DATA FILE: >1073B::B2  
ANALYSIS TIME: 5/17/88 16:57

	<u>BASE-NEUTRAL</u>	<u>RESULTS (uG/L)</u>
1	Acenaphthene	ND
2	Acenaphthylene	ND
3	Aniline	ND
4	Anthracene	ND
5	Benzidine	ND
6	Benz(a)anthracene	ND
7	Benzo(a)pyrene	ND
8	Benzo(b)fluoranthene	ND
9 *	Benzo(ghi)perylene	ND
10	Benzo(k)fluoranthene	ND
11	Benzyl alcohol	ND
12	Benzylbutylphthalate	ND
13	Bis(2-chloroethoxy)methane	ND
14	Bis(2-chloroethyl)ether	ND
15	Bis(2-chloroisopropyl)ether	ND
16	Bis(2-ethylhexyl)phthalate	ND
17	4-Bromophenylphenylether	ND
18	Carbazole	ND
19	4-Chloroaniline	ND
20	2-Chloronaphthalene	ND
21	4-Chlorophenylphenylether	ND
22	Chrysene	ND
23 *	Dibenz(a,h)anthracene	ND
24	Dibenzofuran	ND
25	1,2-Dichlorobenzene	ND
26	1,3-Dichlorobenzene	ND
27	1,4-Dichlorobenzene	ND
28	3,3'-Dichlorobenzidine	ND
29	Diethylphthalate	ND
30	Dimethylphthalate	ND
31	Di-n-butylphthalate	ND
32	Dinitrobenzene	ND
33	2,4-Dinitrotoluene	ND
34	2,6-Dinitrotoluene	ND
35	Di-n-octylphthalate	ND
36	Diphenyl hydrazine	ND
37	Fluoranthene	ND
38	Fluorene	ND
39	Hexachlorobenzene	ND
40	Hexachlorobutadiene	ND
41	Hexachlorocyclopentadiene	ND
42	Hexachloroethane	ND
43 *	Indeno(1,2,3-cd)pyrene	ND
44	Isophorone	ND
45	2-Methylnaphthalene	ND
46	Naphthalene	ND
47	2-Nitroaniline	ND
48	3-Nitroaniline	ND
49	4-Nitroaniline	ND
50	Nitrobenzene	ND



DESCRIPTION : IDEM C3377

EMS SAMPLE# : 102540

DATA FILE: &gt;1073B::B2

51		N-nitrosodiphenylamine	ND
52		N-nitroso-dipropyl-amine	ND
53		Phenanthrene	ND
54	**	2-Picoline	ND
55		Pyrene	ND
56	**	Pyridine	ND
57		Tetrachlorobenzenes	ND
58		Toluenediamine	ND
59		1,2,4-Trichlorobenzene	ND

ACID

1	*	Benzoic acid	ND
2	*	2-Chlorophenol	ND
3	*	2,4-Dichlorophenol	ND
4	*	2,4-Dimethylphenol	ND
5	**	4,6-Dinitro-2-methylphenol	ND
6	**	2,4-Dinitrophenol	ND
7	*	2-Methylphenol	ND
8	*	4-Methylphenol	ND
9	*	2-Nitrophenol	ND
10	*	4-Nitrophenol	ND
11	*	4-Chloro-3-Methylphenol	ND
12	*	Pentachlorophenol	ND
13	*	Phenol	ND
14	*	Tetrachlorophenol	ND
15	*	2,4,5-Trichlorophenol	ND
16	*	2,4,6-Trichlorophenol	ND

PESTICIDES

1		Aldrin	ND
2		alpha-BHC	ND
3		alpha-Endosulfan	ND
4		beta-BHC	ND
5		beta-Endosulfan	ND
6	**	Chlordane	ND
7		p,p'-DDD	ND
8		p,p'-DDE	ND
9		p,p'-DDT	ND
10		delta-BHC	ND
11		Dieldrin	ND
12		Endosulfan sulfate	ND
13		Endrin	ND
14		Endrin aldehyde	ND
15		gamma-BHC (Lindane)	ND
16		Heptachlor	ND
17		Heptachlor epoxide	ND
18		Methoxychlor	ND
19	**	PCB-1016	ND
20	**	PCB-1242	ND
21	**	PBC-1248	ND
22	**	PCB-1254	ND
23	**	PCB-1260	ND
24	**	Toxaphene	ND

DESCRIPTION : IDEM C3377

EMS SAMPLE# : 102540

DATA FILE: &gt;1073B::B2

Surrogate Recovery (Phenols @ 100 uG/L, BN @ 50 uG/L)

1	2-Fluorophenol	66 %
2	Phenol-d5	46 %
3	Nitrobenzene-d5	83 %
4	2-Fluorobiphenyl	69 %
5	2,4,6-Tribromophenol	87 %
6	Terphenyl-d14	86 %

Detection Limits (uG/L): 10

\* Detection Limits (uG/L): 25

\*\* Detection Limits (uG/L): 50

( ) Estimated Concentration below Detection Limit.

Other compounds identified

Dilution Factor 1

Continuing Calibration Check  
HSL Compounds

Case No: _____	Calibration Date: 05/17/88
Contractor: EMS LABS	Time: 14:38
Contract No: _____	Laboratory ID: >1071B
Instrument ID: GC/MS 2	Initial Calibration Date: 05/12/88

Minimum  $\overline{RF}$  for SPCC is 0.050

Maximum % Diff for CCC is 25.0%

Compound	$\overline{RF}$	RF	%Diff	CCC	SPCC
Pyridine	1.65406	-	-		
N-nitroso-dimethyl-amine	.70898	-	-		
2-Picoline	1.02734	-	-		
2-Fluorophenol (surr)	1.05706	.76523	27.61	-	
Phenol-d5 (surr)	1.15282	.87625	23.99		
Aniline	2.06136	1.18222	42.65		
Bis(2-chloroethyl)ether	1.48072	.91457	38.23		
1,3-Dichlorobenzene	1.65970	1.34653	18.87		
2-Chlorophenol	1.43752	1.15838	19.42		
1,4-Dichlorobenzene	1.68630	1.37047	18.73	*	
1,2-Dichlorobenzene	1.62139	1.36959	15.53		
Phenol	1.56304	1.39155	10.97	*	
Benzyl alcohol	1.05883	.95023	10.26		
Bis(2-chloroisopropyl)ether	.83039	.52072	37.29	-	
2-Methylphenol	1.18799	.89427	24.72		
4-Methylphenol	1.25483	.96244	23.30		
Hexachloroethane	.73730	.68849	6.62		
N-Nitroso-dipropyl-amine	.84810	.68839	18.83		**
Nitrobenzene	.55824	.37692	32.48	-	
Isophorone	.88065	.64399	26.87	-	
2-Nitrophenol	.25233	.22251	11.82	*	
Nitrobenzene-d5 (surr)	.49646	.35845	27.80		
Bis(2-chloroethoxy)methane	.49257	.35887	27.14		
1,2,4-Trichlorobenzene	.38989	.37491	3.84		
Naphthalene	1.15193	.93178	19.11		
2,4-Dimethylphenol	.37415	.36573	2.25		
2,4-Dichlorophenol	.33328	.30839	7.47	*	
4-Chloroaniline	.53766	.39027	27.41	-	
Hexachlorobutadiene	.22136	.25865	16.85	*	
Benzoic acid	.23087	.06509	71.81	-	
2-Methylnaphthalene	.80654	.67735	16.02		
1,2,3,4-Tetrachlorobenzene	.63560	-	-		

RF - Response Factor from daily standard file at 50.00 ppb

$\overline{RF}$  - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (\*) SPCC - System Performance Check Compounds (\*\*)

Continuing Calibration Check  
HSL Compounds

Case No: _____	Calibration Date: 05/17/88
Contractor: EMS LABS	Time: 14:38
Contract No: _____	Laboratory ID: >1071B
Instrument ID: GC/MS 2	Initial Calibration Date: 05/12/88

Minimum  $\overline{RF}$  for SPCC is 0.050

Maximum % Diff for CCC is 25.0%

Compound	$\overline{RF}$	RF	%Diff	CCC	SPCC
Hexachlorocyclopentadiene	.40906	.46418	13.48		**
1,2,4,5-Tetrachlorobenzene	.19371	-	-		
4-Chloro-3-Methylphenol	.59990	.49672	17.20	*	
2-Fluorobiphenyl (surr)	1.64506	1.26761	22.94		
2-Chloronaphthalene	1.34058	1.16679	12.96		
Toluenediamine	.33468	-	-		
2,4,6-Trichlorophenol	.42205	.38378	9.07	*	
2,4,5-Trichlorophenol	.42531	.38051	10.54		
2-Nitroaniline	.40002	.30898	22.76		
Acenaphthylene	1.94862	1.60429	17.67		
1,3-Dinitrobenzene	.26671	-	-		
Dimethylphthalate	1.22016	1.32592	8.67		
2,6-Dinitrotoluene	.32161	.29431	8.49		
Acenaphthene	1.30130	1.06218	18.38	*	
3-Nitroaniline	.33950	.34636	2.02		
Dibenzofuran	1.82502	1.55087	15.02		
2,4-Dinitrophenol	.14488	.11031	23.86		**
2,4-Dinitrotoluene	.39283	.34474	12.24		
2,3,4,6-Tetrachlorophenol	-	-	-		
Fluorene	1.30827	1.08568	17.01		
4-Chlorophenylphenylether	.61037	.55371	9.28		
Isopropyl-biphenyl (1)	.37707	-	-		
4-Nitrophenol	.23143	.19903	14.00		**
Diethylphthalate	1.15164	2.74021	137.94	*	
2,4,6-Tribromophenol (surr)	.18864	.21724	15.16		
Diphenyl hydrazine	-	-	-		
4,6-Dinitro-2-methylphenol	.14450	.13084	9.45		
N-Nitrosodiphenylamine	.56217	.50893	9.47	*	
4-Nitroaniline	.18293	.15182	17.00		
Isopropyl-biphenyl (2)	.20005	-	-		
4-Bromophenylphenylether	.28139	.28278	.50		
Chlorodibenzofuran	.56763	-	-		

RF - Response Factor from daily standard file at 50.00 ppb

$\overline{RF}$  - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (\*) SPCC - System Performance Check Compounds (\*\*)

Continuing Calibration Check  
HSL Compounds

Case No: \_\_\_\_\_ Calibration Date: 05/17/88  
Contractor: EMS LABS \_\_\_\_\_ Time: 14:38  
Contract No: \_\_\_\_\_ Laboratory ID: >1071B  
Instrument ID: GC/MS 2 \_\_\_\_\_ Initial Calibration Date: 05/12/88

Minimum  $\overline{RF}$  for SPCC is 0.050

Maximum % Diff for CCC is 25.0%

Compound	$\overline{RF}$	RF	%Diff	CCC	SPCC
alpha-BHC	.15970	.17815	11.55		
Hexachlorobenzene	.31956	.32149	.61		
beta-BHC	.09148	-	-		
gamma-BHC (Lindane)	.09195	-	-		
Phenanthrene	1.11149	1.03788	6.62		
Anthracene	1.06632	.94524	11.36		
Pentachlorophenol	.11522	.14226	23.47	*	
delta-BHC	.09700	-	-		
Carbazole	1.81069	-	-		
Dichlorodibenzofuran	.45594	-	-		
Heptachlor	.17923	.14571	18.70		
Aldrin	.16051	.13135	18.17		
Di-n-butylphthalate	1.36368	1.30142	4.57		
Arochlor-1016	-	-	-		
Arochlor-1221	-	-	-		
Arochlor-1232	-	-	-		
Arochlor-1242	-	-	-		
Arochlor-1254	-	-	-		
Arochlor-1260	-	-	-		
Chlordane	-	-	-		
Toxaphene	-	-	-		
Heptachlor epoxide	.16798	-	-		
Fluoranthene	1.69726	1.41184	16.82	*	
Pyrene	1.72806	1.42057	17.79		
alpha-Endosulfan	.04992	.05035	.86		
Benzidine	.23743	.17219	27.48	-	
Dieldrin	.30523	.24743	18.94		
p,p'-DDE	.31447	.33034	5.05		
Endrin	.10156	-	-		
beta-Endosulfan	.04971	.06139	23.50		
p,p'-DDD	.54822	.46516	15.15		
Endrin aldehyde	.04026	-	-		

RF - Response Factor from daily standard file at 50.00 ppb  
RF - Average Response Factor from Initial Calibration Form VI  
%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (\*) SPCC - System Performance Check Compounds (\*\*)

Continuing Calibration Check  
HSL Compounds

Case No: _____	Calibration Date: 05/17/88
Contractor: EMS LABS	Time: 14:38
Contract No: _____	Laboratory ID: >1071B
Instrument ID: GC/MS 2	Initial Calibration Date: 05/12/88

Minimum  $\overline{RF}$  for SPCC is 0.050

Maximum % Diff for CCC is 25.0%

Compound	$\overline{RF}$	RF	%Diff	CCC	SPCC
Endosulfan sulfate	.10106	-	-		
2,3,7,8-TCDD	-	-	-		
p,p'-DDT	.48317	.41251	14.63		
Benzylbutylphthalate	.89621	.72869	18.69		
Benz(a)anthracene	1.53767	1.19872	22.04		
Chrysene	1.30073	1.05117	19.19		
3,3'-Dichlorobenzidine	.37766	.39217	3.84		
Methoxychlor	-	-	-		
Terphenyl-d14 (surr)	1.45540	1.00426	31.00		
Bis(2-ethylhexyl)phthalate	1.33278	1.05055	21.18		
Di-n-octylphthalate	2.76059	3.14485	13.92	*	
Benzo(b)fluoranthene	1.49855	1.13592	24.20		
Benzo(k)fluoranthene	1.31154	.99944	23.80		
Benzo(a)pyrene	1.14798	.87574	23.71	*	
Indeno(1,2,3-cd)pyrene	.63228	.41923	33.69		
Dibenz(a,h)anthracene	.62884	.42624	32.22		
Benzo(ghi)perylene	.61981	.44429	28.32		

RF - Response Factor from daily standard file at 50.00 ppb  
 RF - Average Response Factor from Initial Calibration Form VI  
 %Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (\*) SPCC - System Performance Check Compounds (\*\*)

**EMS LABS SEMI-VOLATILE ORGANIC ANALYSIS REPORT  
INDIANAPOLIS, INDIANA**

**DESCRIPTION :**

EMS SAMPLE# : BNA-WB  
ANALYSIS METHOD: SW-846 Method 8270

DATA FILE: >1072B::B2  
ANALYSIS TIME: 5/17/88 15:59

	<u>BASE-NEUTRAL</u>	<u>RESULTS (uG/L)</u>
1	Acenaphthene	ND
2	Acenaphthylene	ND
3	Aniline	ND
4	Anthracene	ND
5	Benzidine	ND
6	Benz(a)anthracene	ND
7	Benzo(a)pyrene	ND
8	Benzo(b)fluoranthene	ND
9 *	Benzo(ghi)perylene	ND
10	Benzo(k)fluoranthene	ND
11	Benzyl alcohol	ND
12	Benzylbutylphthalate	ND
13	Bis(2-chloroethoxy)methane	ND
14	Bis(2-chloroethyl)ether	ND
15	Bis(2-chloroisopropyl)ether	ND
16	Bis(2-ethylhexyl)phthalate	ND
17	4-Bromophenylphenylether	ND
18	Carbazole	ND
19	4-Chloroaniline	ND
20	2-Chloronaphthalene	ND
21	4-Chlorophenylphenylether	ND
22	Chrysene	ND
23 *	Dibenz(a,h)anthracene	ND
24	Dibenzofuran	ND
25	1,2-Dichlorobenzene	ND
26	1,3-Dichlorobenzene	ND
27	1,4-Dichlorobenzene	ND
28	3,3'-Dichlorobenzidine	ND
29	Diethylphthalate	(3.4)
30	Dimethylphthalate	ND
31	Di-n-butylphthalate	ND
32	Dinitrobenzene	ND
33	2,4-Dinitrotoluene	ND
34	2,6-Dinitrotoluene	ND
35	Di-n-octylphthalate	ND
36	Diphenyl hydrazine	ND
37	Fluoranthene	ND
38	Fluorene	ND
39	Hexachlorobenzene	ND
40	Hexachlorobutadiene	ND
41	Hexachlorocyclopentadiene	ND
42	Hexachloroethane	ND
43 *	Indeno(1,2,3-cd)pyrene	ND
44	Isophorone	ND
45	2-Methylnaphthalene	ND
46	Naphthalene	ND
47	2-Nitroaniline	ND
48	3-Nitroaniline	ND
49	4-Nitroaniline	ND
50	Nitrobenzene	ND

## DESCRIPTION :

EMS SAMPLE# : BNA-WB

DATA FILE: &gt;1072B::B2

51		N-nitrosodiphenylamine	ND
52		N-nitroso-dipropyl-amine	ND
53		Phenanthrene	ND
54	**	2-Picoline	ND
55		Pyrene	ND
56	**	Pyridine	ND
57		Tetrachlorobenzenes	ND
58		Toluenediamine	ND
59		1,2,4-Trichlorobenzene	ND

ACID

1	*	Benzoic acid	ND
2	*	2-Chlorophenol	ND
3	*	2,4-Dichlorophenol	ND
4	*	2,4-Dimethylphenol	ND
5	**	4,6-Dinitro-2-methylphenol	ND
6	**	2,4-Dinitrophenol	ND
7	*	2-Methylphenol	ND
8	*	4-Methylphenol	ND
9	*	2-Nitrophenol	ND
10	*	4-Nitrophenol	ND
11	*	4-Chloro-3-Methylphenol	ND
12	*	Pentachlorophenol	ND
13	*	Phenol	ND
14	*	Tetrachlorophenol	ND
15	*	2,4,5-Trichlorophenol	ND
16	*	2,4,6-Trichlorophenol	ND

PESTICIDES

1		Aldrin	ND
2		alpha-BHC	ND
3		alpha-Endosulfan	ND
4		beta-BHC	ND
5		beta-Endosulfan	ND
6	**	Chlordane	ND
7		p,p'-DDD	ND
8		p,p'-DDE	ND
9		p,p'-DDT	ND
10		delta-BHC	ND
11		Dieldrin	ND
12		Endosulfan sulfate	ND
13		Endrin	ND
14		Endrin aldehyde	ND
15		gamma-BHC (Lindane)	ND
16		Heptachlor	ND
17		Heptachlor epoxide	ND
18		Methoxychlor	ND
19	**	PCB-1016	ND
20	**	PCB-1242	ND
21	**	PBC-1248	ND
22	**	PCB-1254	ND
23	**	PCB-1260	ND
24	**	Toxaphene	ND



## DESCRIPTION :

EMS SAMPLE# : BNA-WB

DATA FILE: &gt;1072B::B2

Surrogate Recovery (Phenols @ 100 uG/L, BN @ 50 uG/L)

1	2-Fluorophenol	54 %
2	Phenol-d5	31 %
3	Nitrobenzene-d5	100 %
4	2-Fluorobiphenyl	86 %
5	2,4,6-Tribromophenol	106 %
6	Terphenyl-d14	90 %

Detection Limits (uG/L): 10

\* Detection Limits (uG/L): 25

\*\* Detection Limits (uG/L): 50

( ) Estimated Concentration below Detection Limit.

Other compounds identified

UNKNOWN : R.T. - 29.58

Dilution Factor 1

# WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name : EMS LABORATORIES

EMS Sample No. : CLP MS/MSD

MS DATA FILE : >1095B

MSD DATA FILE : >1096B

ANALYSIS METHOD: SW-846 Method 8270

ANALYSIS TIME: 5/14/88

COMPOUND	SPIKE ADDED (MG/KG)	SAMPLE CONCENTRATION (MG/KG)	MS CONCENTRATION (MG/KG)	MS % REC	QC LIMITS REC.
Phenol	200	0	45.	23.	12- 89
2-Chlorophenol	200	0	136.	68.	27-123
1,4-Dichlorobenzene	100	0	71.	71.	36- 97
N-Nitroso-dipropylamine	100	0	80.	80.	41-116
1,2,4-Trichlorobenzene	100	0	69.	69.	39- 98
4-Chloro-3-Methylphenol	200	0	181.	90.	23- 97
Acenaphthene	100	0	74.	74.	46-118
4-Nitrophenol	200	0	79.	39.	10- 80
2,4-Dinitrotoluene	100	0	88.	88.	24- 96
Pentachlorophenol	200	0	159.	79.	9-103
Pyrene	100	0	140.	140.*	26-127

COMPOUND	SPIKE ADDED (MG/KG)	MSD CONC. (MG/KG)	MSD % REC #	% RPD #	QC LIMITS RPD REC.
Phenol	200	40.	20.	14.	42 12- 89
2-Chlorophenol	200	134.	67.	1.	40 27-123
1,4-Dichlorobenzene	100	64.	64.	10.	28 36- 97
N-Nitroso-dipropylamine	100	79.	79.	1.	38 41-116
1,2,4-Trichlorobenzene	100	64.	64.	8.	28 39- 98
4-Chloro-3-Methylphenol	200	178.	89.	1.	42 23- 97
Acenaphthene	100	71.	71.	4.	31 46-118
4-Nitrophenol	200	54.	27.	36.	50 10- 80
2,4-Dinitrotoluene	100	89.	89.	1.	38 24- 96
Pentachlorophenol	200	138.	69.	14.	50 9-103
Pyrene	100	131.	131. *	7.	31 26-127

# Column to be used to flag recovery and RPD values with an asterisk

\* Values outside of QC limits

RPD: 0 outside of QC limits

Spike Recovery: 2 outside of QC limits

Comments: \_\_\_\_\_

# C E R T I F I C A T E   O F   A N A L Y S I S

## CORRESPOND TO

EMS Laboratories, Inc.  
7901 West Morris Street  
Indianapolis, Indiana 46231  
(317) 243-8304

## SAMPLE

EMS SAMPLE : 102541  
REPORT DATE : 05/25/88  
DATE RECEIVED : 05/11/88  
DATE COMPLETE : 05/24/88

## REPORT TO

GREG BUSCH  
INDIANA DEPARTMENT OF ENVIRONMENTAL MGT.  
P.O. BOX 6015  
INDIANAPOLIS IN 46206-6015

## BILL TO

CARLA HATTON  
INDIANA DEPARTMENT OF ENVIRONMENTAL MGT.  
P.O. BOX 6015  
INDIANAPOLIS IN 46206-6015

## DESCRIPTION

C3378

IDEM

DATE SAMPLED : 5/10/88

TIME SAMPLED : 2:45 PM

TEST DESCRIPTION ANALYTE	RESULT	METHOD	DATE DET. LIMIT	ANALYST UNITS
PCB, GAS CHROMATOGRAPHY:ECD ..	AROCLOR 1016 .....	SW846-8080	05/18/88	EMW
AROCLOR 1016 .....	: ND DL: 0.0001		SEE RESULT	MG/L
AROCLOR 1221 .....	: ND DL: 0.0005			
AROCLOR 1232 .....	: ND DL: 0.0001			
AROCLOR 1242 .....	: ND DL: 0.0001			
AROCLOR 1248 .....	: ND DL: 0.0001			
AROCLOR 1254 .....	: ND DL: 0.0001			
AROCLOR 1260 .....	: ND DL: 0.0001			
DCB % RECOVERY .....	: 96			
SEMI-VOLATILE ORGANICS, RCRA .....	SW846-8270	05/17/88	SHG	
SEMI-VOL (ISBH).....	: ATTACHED	NA	NA	
FILE REFERENCE NO. .	: G1074B			
DAILY CAL CHECK FILE	: G1071B.C			
BLANK FRN.....	: G1072B.B			
SPIKE/SPIKE DUP FILE	: G1095B.M			
EXTRACTED STANDARD .	: NA			
PCB EXTRACTION, WATER .....	SW846-3510	05/16/88	RKB	
PCB EXT., WATER ....	: COMPLETE	NA		
SEMI-VOLATILE EXTRACTION, ACID/BASE/NEUTRAL .....	SEE SEMI-V	05/16/88	RKB	
S-VOL EXT., A/B/N ..	: COMPLETE	NA	NA	
INITIAL WT OR VOL ..	: 1L			
FINAL VOLUME, ML ...	: 1ML			

ND - Not Detected

**EMS LABS SEMI-VOLATILE ORGANIC ANALYSIS REPORT  
INDIANAPOLIS, INDIANA**

DESCRIPTION : IDEM C3378

EMS SAMPLE# : 102541  
ANALYSIS METHOD: SW-846 Method 8270

DATA FILE: >1074B::B2  
ANALYSIS TIME: 5/17/88 17:54

	<u>BASE-NEUTRAL</u>	<u>RESULTS (uG/L)</u>
1	Acenaphthene	ND
2	Acenaphthylene	ND
3	Aniline	ND
4	Anthracene	ND
5	Benzidine	ND
6	Benz(a)anthracene	ND
7	Benzo(a)pyrene	ND
8	Benzo(b)fluoranthene	ND
9 *	Benzo(ghi)perylene	ND
10	Benzo(k)fluoranthene	ND
11	Benzyl alcohol	ND
12	Benzylbutylphthalate	ND
13	Bis(2-chloroethoxy)methane	ND
14	Bis(2-chloroethyl)ether	ND
15	Bis(2-chloroisopropyl)ether	ND
16	Bis(2-ethylhexyl)phthalate	ND
17	4-Bromophenylphenylether	ND
18	Carbazole	ND
19	4-Chloroaniline	ND
20	2-Chloronaphthalene	ND
21	4-Chlorophenylphenylether	ND
22	Chrysene	ND
23 *	Dibenz(a,h)anthracene	ND
24	Dibenzofuran	ND
25	1,2-Dichlorobenzene	ND
26	1,3-Dichlorobenzene	ND
27	1,4-Dichlorobenzene	ND
28	3,3'-Dichlorobenzidine	ND
29	Diethylphthalate	ND
30	Dimethylphthalate	ND
31	Di-n-butylphthalate	ND
32	Dinitrobenzene	ND
33	2,4-Dinitrotoluene	ND
34	2,6-Dinitrotoluene	ND
35	Di-n-octylphthalate	ND
36	Diphenyl hydrazine	ND
37	Fluoranthene	ND
38	Fluorene	ND
39	Hexachlorobenzene	ND
40	Hexachlorobutadiene	ND
41	Hexachlorocyclopentadiene	ND
42	Hexachloroethane	ND
43 *	Indeno(1,2,3-cd)pyrene	ND
44	Isophorone	ND
45	2-Methylnaphthalene	ND
46	Naphthalene	ND
47	2-Nitroaniline	ND
48	3-Nitroaniline	ND
49	4-Nitroaniline	ND
50	Nitrobenzene	ND

DESCRIPTION : IDEM C3378

EMS SAMPLE# : 102541

DATA FILE: &gt;1074B::B2

51		N-nitrosodiphenylamine	ND
52		N-nitroso-dipropyl-amine	ND
53		Phenanthrene	ND
54	**	2-Picoline	ND
55		Pyrene	ND
56	**	Pyridine	ND
57		Tetrachlorobenzenes	ND
58		Toluenediamine	ND
59		1,2,4-Trichlorobenzene	ND

ACID

1	*	Benzoic acid	ND
2	*	2-Chlorophenol	ND
3	*	2,4-Dichlorophenol	ND
4	*	2,4-Dimethylphenol	ND
5	**	4,6-Dinitro-2-methylphenol	ND
6	**	2,4-Dinitrophenol	ND
7	*	2-Methylphenol	ND
8	*	4-Methylphenol	ND
9	*	2-Nitrophenol	ND
10	*	4-Nitrophenol	ND
11	*	4-Chloro-3-Methylphenol	ND
12	*	Pentachlorophenol	ND
13	*	Phenol	ND
14	*	Tetrachlorophenol	ND
15	*	2,4,5-Trichlorophenol	ND
16	*	2,4,6-Trichlorophenol	ND

PESTICIDES

1		Aldrin	ND
2		alpha-BHC	ND
3		alpha-Endosulfan	ND
4		beta-BHC	ND
5		beta-Endosulfan	ND
6	**	Chlordane	ND
7		p,p'-DDD	ND
8		p,p'-DDE	ND
9		p,p'-DDT	ND
10		delta-BHC	ND
11		Dieldrin	ND
12		Endosulfan sulfate	ND
13		Endrin	ND
14		Endrin aldehyde	ND
15		gamma-BHC (Lindane)	ND
16		Heptachlor	ND
17		Heptachlor epoxide	ND
18		Methoxychlor	ND
19	**	PCB-1016	ND
20	**	PCB-1242	ND
21	**	PBC-1248	ND
22	**	PCB-1254	ND
23	**	PCB-1260	ND
24	**	Toxaphene	ND

DESCRIPTION : IDEM C3378

EMS SAMPLE# : 102541

DATA FILE: &gt;1074B::B2

Surrogate Recovery (Phenols @ 100 uG/L, BN @ 50 uG/L)

1	2-Fluorophenol	61 %
2	Phenol-d5	43 %
3	Nitrobenzene-d5	83 %
4	2-Fluorobiphenyl	68 %
5	2,4,6-Tribromophenol	89 %
6	Terphenyl-d14	85 %

Detection Limits (uG/L): 10

\* Detection Limits (uG/L): 25

\*\* Detection Limits (uG/L): 50

( ) Estimated Concentration below Detection Limit.

Other compounds identified

UNKNOWN : RT. - 11.31

Dilution Factor 1

# C E R T I F I C A T E   O F   A N A L Y S I S

----- CORRESPOND TO -----

----- SAMPLE -----

EMS Laboratories, Inc.  
7901 West Morris Street  
Indianapolis, Indiana 46231  
(317) 243-8304

EMS SAMPLE : 102542  
REPORT DATE : 05/25/88  
DATE RECEIVED : 05/11/88  
DATE COMPLETE : 05/24/88

----- REPORT TO -----

----- BILL TO -----

GREG BUSCH  
INDIANA DEPARTMENT OF ENVIRONMENTAL MGT.  
P.O. BOX 6015  
INDIANAPOLIS IN 46206-6015

CARLA HATTON  
INDIANA DEPARTMENT OF ENVIRONMENTAL MGT.  
P.O. BOX 6015  
INDIANAPOLIS IN 46206-6015

## ----- DESCRIPTION -----

C3379

IDEM

DATE SAMPLED : 5/10/88

TIME SAMPLED : 2:45 PM

TEST DESCRIPTION ANALYTE	RESULT	METHOD	DATE DET. LIMIT	ANALYST UNITS
PCB, GAS CHROMATOGRAPHY:ECD ..	AROCLOR 1016 .....	SW846-8080	05/18/88	EMW
AROCLOR 1016 .....	: ND DL: 0.0001		SEE RESULT	MG/L
AROCLOR 1221 .....	: ND DL: 0.0005			
AROCLOR 1232 .....	: ND DL: 0.0001			
AROCLOR 1242 .....	: ND DL: 0.0001			
AROCLOR 1248 .....	: ND DL: 0.0001			
AROCLOR 1254 .....	: ND DL: 0.0001			
AROCLOR 1260 .....	: ND DL: 0.0001			
DBC % RECOVERY .....	: 95			
SEMI-VOLATILE ORGANICS, RCRA .....	SW846-8270		05/17/88	SHG
SEMI-VOL (ISBH).....	: ATTACHED		NA	NA
FILE REFERENCE NO. .	: G1075B			
DAILY CAL CHECK FILE	: G1071B.C			
BLANK FRN.....	: G1072B.B			
SPIKE/SPIKE DUP FILE	: G1095B.M			
EXTRACTED STANDARD .	: NA			
SEMI-VOLATILE EXTRACTION, ACID/BASE/NEUTRAL .....	SEE SEMI-V		05/16/88	RKB
S-VOL EXT., A/B/N ..	: COMPLETE		NA	NA
INITIAL WT OR VOL ..	: 1L			
FINAL VOLUME, ML ...	: 1ML			

ND - Not Detected

NA - Not Applicable

Sample was accompanied by chain of custody papers

Approved by :

*DP Peterson*

Page 1 of 1

**EMS LABS SEMI-VOLATILE ORGANIC ANALYSIS REPORT**  
**INDIANAPOLIS, INDIANA**

DESCRIPTION : IDEM C3379

EMS SAMPLE# : 102542  
 ANALYSIS METHOD: SW-846 Method 8270

DATA FILE: >1075B::B2  
 ANALYSIS TIME: 5/17/88 18:51

	<u>BASE-NEUTRAL</u>	<u>RESULTS (uG/L)</u>
1	Acenaphthene	ND
2	Acenaphthylene	ND
3	Aniline	ND
4	Anthracene	ND
5	Benzidine	ND
6	Benz(a)anthracene	ND
7	Benzo(a)pyrene	ND
8	Benzo(b)fluoranthene	ND
9 *	Benzo(ghi)perylene	ND
10	Benzo(k)fluoranthene	ND
11	Benzyl alcohol	ND
12	Benzylbutylphthalate	ND
13	Bis(2-chloroethoxy)methane	ND
14	Bis(2-chloroethyl)ether	ND
15	Bis(2-chloroisopropyl)ether	ND
16	Bis(2-ethylhexyl)phthalate	ND
17	4-Bromophenylphenylether	ND
18	Carbazole	ND
19	4-Chloroaniline	ND
20	2-Chloronaphthalene	ND
21	4-Chlorophenylphenylether	ND
22	Chrysene	ND
23 *	Dibenz(a,h)anthracene	ND
24	Dibenzofuran	ND
25	1,2-Dichlorobenzene	ND
26	1,3-Dichlorobenzene	ND
27	1,4-Dichlorobenzene	ND
28	3,3'-Dichlorobenzidine	ND
29	Diethylphthalate	ND
30	Dimethylphthalate	ND
31	Di-n-butylphthalate	ND
32	Dinitrobenzene	ND
33	2,4-Dinitrotoluene	ND
34	2,6-Dinitrotoluene	ND
35	Di-n-octylphthalate	ND
36	Diphenyl hydrazine	ND
37	Fluoranthene	ND
38	Fluorene	ND
39	Hexachlorobenzene	ND
40	Hexachlorobutadiene	ND
41	Hexachlorocyclopentadiene	ND
42	Hexachloroethane	ND
43 *	Indeno(1,2,3-cd)pyrene	ND
44	Isophorone	ND
45	2-Methylnaphthalene	ND
46	Naphthalene	ND
47	2-Nitroaniline	ND
48	3-Nitroaniline	ND
49	4-Nitroaniline	ND
50	Nitrobenzene	ND



DESCRIPTION : IDEM C3379

EMS SAMPLE# : 102542

DATA FILE: &gt;1075B::B2

51		N-nitrosodiphenylamine	ND
52		N-nitroso-dipropyl-amine	ND
53		Phenanthrene	ND
54	**	2-Picoline	ND
55		Pyrene	ND
56	**	Pyridine	ND
57		Tetrachlorobenzenes	ND
58		Toluenediamine	ND
59		1,2,4-Trichlorobenzene	ND

ACID

1	*	Benzoic acid	ND
2	*	2-Chlorophenol	ND
3	*	2,4-Dichlorophenol	ND
4	*	2,4-Dimethylphenol	ND
5	**	4,6-Dinitro-2-methylphenol	ND
6	**	2,4-Dinitrophenol	ND
7	*	2-Methylphenol	ND
8	*	4-Methylphenol	ND
9	*	2-Nitrophenol	ND
10	*	4-Nitrophenol	ND
11	*	4-Chloro-3-Methylphenol	ND
12	*	Pentachlorophenol	ND
13	*	Phenol	ND
14	*	Tetrachlorophenol	ND
15	*	2,4,5-Trichlorophenol	ND
16	*	2,4,6-Trichlorophenol	ND

PESTICIDES

1		Aldrin	ND
2		alpha-BHC	ND
3		alpha-Endosulfan	ND
4		beta-BHC	ND
5		beta-Endosulfan	ND
6	**	Chlordane	ND
7		p,p'-DDD	ND
8		p,p'-DDE	ND
9		p,p'-DDT	ND
10		delta-BHC	ND
11		Dieldrin	ND
12		Endosulfan sulfate	ND
13		Endrin	ND
14		Endrin aldehyde	ND
15		gamma-BHC (Lindane)	ND
16		Heptachlor	ND
17		Heptachlor epoxide	ND
18		Methoxychlor	ND
19	**	PCB-1016	ND
20	**	PCB-1242	ND
21	**	PBC-1248	ND
22	**	PCB-1254	ND
23	**	PCB-1260	ND
24	**	Toxaphene	ND

DESCRIPTION : IDEM C3379

EMS SAMPLE# : 102542

DATA FILE: &gt;1075B::B2

Surrogate Recovery (Phenols @ 100 uG/L, BN @ 50 uG/L)

1	2-Fluorophenol	59 %
2	Phenol-d5	43 %
3	Nitrobenzene-d5	68 %
4	2-Fluorobiphenyl	64 %
5	2,4,6-Tribromophenol	78 %
6	Terphenyl-d14	86 %

Detection Limits (uG/L): 10

\* Detection Limits (uG/L): 25

\*\* Detection Limits (uG/L): 50

( ) Estimated Concentration below Detection Limit.

Other compounds identified

UNKNOWN : R.T. - 17.10

Dilution Factor 1

# C E R T I F I C A T E   O F   A N A L Y S I S

**CORRESPOND TO**

**SAMPLE**

EMS Laboratories, Inc.  
7901 West Morris Street  
Indianapolis, Indiana 46231  
(317) 243-8304

EMS SAMPLE : 102543  
REPORT DATE : 05/25/88  
DATE RECEIVED : 05/11/88  
DATE COMPLETE : 05/24/88

**REPORT TO**

**BILL TO**

GREG BUSCH  
INDIANA DEPARTMENT OF ENVIRONMENTAL MGT.  
P.O. BOX 6015  
INDIANAPOLIS IN 46206-6015

CARLA HATTON  
INDIANA DEPARTMENT OF ENVIRONMENTAL MGT.  
P.O. BOX 6015  
INDIANAPOLIS IN 46206-6015

## D E S C R I P T I O N

C3380  
IDEM  
DATE SAMPLED : 5/10/88

TIME SAMPLED : 2:45 PM


TEST DESCRIPTION ANALYTE	RESULT	METHOD	DATE DET. LIMIT	ANALYST UNITS
PCB, GAS CHROMATOGRAPHY: ECD .. AROCLOR 1016 .....	SW846-8080	05/18/88	EMW	
AROCLOR 1016 .....	: ND DL: 0.0001	SEE RESULT	MG/L	
AROCLOR 1221 .....	: ND DL: 0.0005			
AROCLOR 1232 .....	: ND DL: 0.0001			
AROCLOR 1242 .....	: ND DL: 0.0001			
AROCLOR 1248 .....	: ND DL: 0.0001			
AROCLOR 1254 .....	: ND DL: 0.0001			
AROCLOR 1260 .....	: ND DL: 0.0001			
DBC % RECOVERY .....	: 95			
SEMI-VOLATILE ORGANICS, RCRA .....	SW846-8270	05/17/88	SHG	
SEMI-VOL (ISBH) .....	: ATTACHED	NA	NA	
FILE REFERENCE NO. .	: G1076B			
DAILY CAL CHECK FILE	: G1071B.C			
BLANK FRN .....	: G1072B.B			
SPIKE/SPIKE DUP FILE	: G1095B.M			
EXTRACTED STANDARD .	: NA			
SEMI-VOLATILE EXTRACTION, ACID/BASE/NEUTRAL .....	SEE SEMI-V	05/16/88	RKB	
S-VOL EXT., A/B/N ..	: COMPLETE	NA	NA	
INITIAL WT OR VOL ..	: 1L			
FINAL VOLUME, ML ...	: 1ML			

ND - Not Detected

NA - Not Applicable

Sample was accompanied by chain of custody papers

Approved by :



**EMS LABS SEMI-VOLATILE ORGANIC ANALYSIS REPORT**  
**INDIANAPOLIS, INDIANA**

DESCRIPTION : IDEM C3380

EMS SAMPLE# : 102543  
 ANALYSIS METHOD: SW-846 Method 8270

DATA FILE: >1076B::B2  
 ANALYSIS TIME: 5/17/88 19:48

	<u>BASE-NEUTRAL</u>	<u>RESULTS (uG/L)</u>
1	Acenaphthene	ND
2	Acenaphthylene	ND
3	Aniline	ND
4	Anthracene	ND
5	Benzidine	ND
6	Benz(a)anthracene	ND
7	Benzo(a)pyrene	ND
8	Benzo(b)fluoranthene	ND
9 *	Benzo(ghi)perylene	ND
10	Benzo(k)fluoranthene	ND
11	Benzyl alcohol	ND
12	Benzylbutylphthalate	ND
13	Bis(2-chloroethoxy)methane	ND
14	Bis(2-chloroethyl)ether	ND
15	Bis(2-chloroisopropyl)ether	ND
16	Bis(2-ethylhexyl)phthalate	ND
17	4-Bromophenylphenylether	ND
18	Carbazole	ND
19	4-Chloroaniline	ND
20	2-Chloronaphthalene	ND
21	4-Chlorophenylphenylether	ND
22	Chrysene	ND
23 *	Dibenz(a,h)anthracene	ND
24	Dibenzofuran	ND
25	1,2-Dichlorobenzene	ND
26	1,3-Dichlorobenzene	ND
27	1,4-Dichlorobenzene	ND
28	3,3'-Dichlorobenzidine	ND
29	Diethylphthalate	ND
30	Dimethylphthalate	ND
31	Di-n-butylphthalate	ND
32	Dinitrobenzene	ND
33	2,4-Dinitrotoluene	ND
34	2,6-Dinitrotoluene	ND
35	Di-n-octylphthalate	ND
36	Diphenyl hydrazine	ND
37	Fluoranthene	ND
38	Fluorene	ND
39	Hexachlorobenzene	ND
40	Hexachlorobutadiene	ND
41	Hexachlorocyclopentadiene	ND
42	Hexachloroethane	ND
43 *	Indeno(1,2,3-cd)pyrene	ND
44	Isophorone	ND
45	2-Methylnaphthalene	ND
46	Naphthalene	ND
47	2-Nitroaniline	ND
48	3-Nitroaniline	ND
49	4-Nitroaniline	ND
50	Nitrobenzene	ND

DESCRIPTION : IDEM C3380

EMS SAMPLE# : 102543

DATA FILE: &gt;1076B::B2

51		N-nitrosodiphenylamine	ND
52		N-nitroso-dipropyl-amine	ND
53		Phenanthrene	ND
54	**	2-Picoline	ND
55		Pyrene	ND
56	**	Pyridine	ND
57		Tetrachlorobenzenes	ND
58		Toluenediamine	ND
59		1,2,4-Trichlorobenzene	ND

ACID

1	*	Benzoic acid	ND
2	*	2-Chlorophenol	ND
3	*	2,4-Dichlorophenol	ND
4	*	2,4-Dimethylphenol	ND
5	**	4,6-Dinitro-2-methylphenol	ND
6	**	2,4-Dinitrophenol	ND
7	*	2-Methylphenol	ND
8	*	4-Methylphenol	ND
9	*	2-Nitrophenol	ND
10	*	4-Nitrophenol	ND
11	*	4-Chloro-3-Methylphenol	ND
12	*	Pentachlorophenol	ND
13	*	Phenol	ND
14	*	Tetrachlorophenol	ND
15	*	2,4,5-Trichlorophenol	ND
16	*	2,4,6-Trichlorophenol	ND

PESTICIDES

1		Aldrin	ND
2		alpha-BHC	ND
3		alpha-Endosulfan	ND
4		beta-BHC	ND
5		beta-Endosulfan	ND
6	**	Chlordane	ND
7		p,p'-DDD	ND
8		p,p'-DDE	ND
9		p,p'-DDT	ND
10		delta-BHC	ND
11		Dieldrin	ND
12		Endosulfan sulfate	ND
13		Endrin	ND
14		Endrin aldehyde	ND
15		gamma-BHC (Lindane)	ND
16		Heptachlor	ND
17		Heptachlor epoxide	ND
18		Methoxychlor	ND
19	**	PCB-1016	ND
20	**	PCB-1242	ND
21	**	PBC-1248	ND
22	**	PCB-1254	ND
23	**	PCB-1260	ND
24	**	Toxaphene	ND

DESCRIPTION : IDEM C3380

EMS SAMPLE# : 102543

DATA FILE: &gt;1076B::B2

Surrogate Recovery (Phenols @ 100 uG/L, BN @ 50 uG/L)

1	2-Fluorophenol	41 %
2	Phenol-d5	23 %
3	Nitrobenzene-d5	63 %
4	2-Fluorobiphenyl	53 %
5	2,4,6-Tribromophenol	61 %
6	Terphenyl-d14	68 %

Detection Limits (uG/L): 10

\* Detection Limits (uG/L): 25

\*\* Detection Limits (uG/L): 50

( ) Estimated Concentration below Detection Limit.

Other compounds identified

UNKNOWN : RT - 23.19, 25.47, 27.40, 29.03, 29.82

TETRADECADIENE

HEXADECANOL

OCTADECENOL

HEXADECENE

OCTADECADIENOL(S)

Dilution Factor 1

STATE OF INDIANA  
**INVOICE - VOUCHER**

Warrant No. \_\_\_\_\_

VENDOR FILL IN. Prepare a separate invoice for each purchase order received. Make five copies.

JUN 13 2 24 PM '88

VENDOR FILL IN. Enter below the data that appears in the upper left corner of the Purchase Order issued to you.

Invoice Number 9278-01 Date 6-10-88

Order Number P- 87601340

Account Number 361-424.370

State Agency Dept. of Environ. Mgt. 4

Appr. Name Solid & Hazardous Waste

Vendor's Name and Address  
EIS Environmental Engineers, Inc.  
1701 N. Ironwood Dr.  
South Bend, IN 46635

Delivered to  
Mr. Gregory A. Busch  
Quality Assurance Manager  
Indiana Environ. Mgmt. Board  
105 S. Meridian St.  
Indianapolis, IN 46225

IMPORTANT: Send three copies of this invoice directly to:  
AUDITOR OF STATE, STATE HOUSE, INDIANAPOLIS  
Do not send to State Agency to whom delivery was made.

**VENDOR LEAVE BLANK**

Gross Amt. \_\_\_\_\_

Discount \_\_\_\_\_

AMT. LIQ. \_\_\_\_\_ AMT. PAID \_\_\_\_\_

CHECKED	POSTED	OBJECT	AMOUNT
Ext	PO		
PO	E&E		
RR	AL		

Approved for Payment \_\_\_\_\_

Rec. No.	Quantity	Unit	Article and Description	Unit Price	Amount
			RFP #A 70-957		
			Analysis of two (2) soil/sediment and six (6) water samples for TASKS 1 and 5 as specifically requested by the EMB sampling team. Since solid samples were present, and solids are not covered in the groundwater contract, this invoice is for TASKS Total Metals and VOA. A 30 day turn-around-time was requested.		
			o EMB Samples C3373 - C3380		
			o EIS Lab No. LP441 - LP448		
			Billable Items are as follows:		
	2	Samples	Soil for TASK Total Metals	\$ 220	\$ 440.00
	2	Samples	Soil for TASK VOA	270	540.00
	2	Samples	Soil for Solids 105	5	10.00
	6	Samples	Water for TASK Total Metals	220	1,320.00
	6	Samples	Water for TASK VOA	180	1,080.00
	1	Sample	Water reanalyzed for TASK VOA to show matrix interference with surrogate recovery		180.00
			GROSS AMOUNT OF INVOICE (Subject to terms below)		\$ 3,570.00

VENDOR: Execute certificate below. SHOW TERMS HERE:

Pursuant to the provisions and penalties of Chapter 155 Acts of 1953.

I hereby certify that the foregoing account is just and correct that the amount claimed is legally due, after allowing all just credits and that no part of the same has been paid.

Date \_\_\_\_\_

X EIS Environmental Engineers, Inc.

X By Andie Royle President

X 1701 N. Ironwood Dr.

X South Bend, (Street or R.F.D.) IN 46635

INDIANA DEPT. OF ENVIRONMENTAL MGMT.  
CHAIN OF CUSTODY

Date: 5-10-88

<u>SAMPLE #</u>	<u>DESCRIPTION</u>	<u>TIME COLLECTED</u>
C3373	VOA & metals to be taken out of same wide mouth amber	1:30p
C3374		1:45p
C3375	Filtered at Lab, had been preserved in field	2:15p
C3376		2:25p
C3377	<del>Municipal</del> WATER	2:30p
C3378	WATER	2:45p
C3379	WATER	2:45
C3380	WATER	2:45
FOR Task #1 & Task #5		30 day turnaround

Samples Relinquished By: Timothy C. Heffernan

Title or Position: ENV. Scientist III

Samples Received By: David M. Nye

Title or Position: Lab MGR.



EIS ENVIRONMENTAL ENGINEERS, INC.  
ANALYTICAL REPORT SHEET  
GROUNDWATER MONITORING ANALYSIS

EMB Sample: C3373-SoilEIS # LP441Date Received: 30Received By: DNDate Report Submitted: 6-10-88TASK 1Moisture: 25.5%Turn Around Time 30 days

Mercury Preservative Batch No. \_\_\_\_\_

Other Metal Preservative Batch No. \_\_\_\_\_

<u>Parameter</u>	<u>Result (mg/kg)</u>	<u>Replicate (mg/kg)</u>	<u>Precision (% RSD)</u>	<u>Accuracy (% R) Matrix Spike</u>
Arsenic	0.51			
Barium	200	180 ✓	7.4 ✓	
Cadmium	0.91	0.60	29.	
Chromium	17.	12.8	19.9	
Lead	107.	114	4.5	
Mercury	0.15	0.12	15.7	
Nickel	10.	13.	18.4	
Selenium	<0.17			80.
Silver	<0.66	<0.60	0	

TASK 2

Turn Around Time \_\_\_\_\_ days

Phenol Preservative Batch No. \_\_\_\_\_

<u>Parameter</u>	<u>Result (mg/l)</u>	<u>Replicate (mg/l)</u>	<u>Precision (% RSD)</u>	<u>Accuracy (% R) Matrix Spike</u>
Chloride				
Iron				
Manganese				
Phenols				
Sodium				
Sulfate				

EIS ENVIRONMENTAL ENGINEERS, INC.  
ANALYTICAL REPORT SHEET  
GROUNDWATER MONITORING ANALYSIS

EMB Sample C3373-SoilEIS # LP441

Parameter		* Result (mg/kg)	Replicate (mg/kg)	Precision (% RSD)
1,2-Dichloropropane	**	<0.1		
c-1,2-Dichloropropene		<0.1		
t-1,2-Dichloropropene		<0.1		
Ethylbenzene		<0.1		
Fluorotrichloromethane		<0.1		
2-Hexanone		<0.5		
Methylene Chloride	0.2			
Methyl Ethyl Ketone	4.5			
Methyl Isobutyl Ketone		<0.5		
Paraldehyde		<10		
Styrene	0.8			
1,1,2,2-Tetrachloroethane		<0.1		
Tetrachloroethylene		<0.1		
Toluene	1.2			
1,1,1-Trichloroethane	0.1			
1,1,2-Trichloroethane		<0.1		
Trichloroethylene	**	<0.1		
Vinyl Acetate		<0.5		
Vinyl Chloride		<0.1		
m-Xylene		<0.1		
o-Xylene		<0.1		
p-Xylene	0.2			
Diethyl Ether	0.6			

\* As received basis - see Method Blank

\*\* Present but below PQL

EIS ENVIRONMENTAL ENGINEERS, INC.  
ANALYTICAL REPORT SHEET  
GROUNDWATER MONITORING ANALYSIS

EMB Sample: C3374 EIS # LP442

Date Received: 5-10-88 Received By: DN Date Report Submitted: 6-10-88

TASK 1

Moisture: 17.8%

Turn Around Time 30 days

Mercury Preservative Batch No. \_\_\_\_\_

Other Metal Preservative Batch No. \_\_\_\_\_

<u>Parameter</u>	<u>Result</u> <u>(mg/kg)</u>	<u>Replicate</u> <u>(mg/kg)</u>	<u>Precision</u> <u>(% RSD)</u>	<u>Accuracy (% R)</u> <u>Matrix Spike</u>
Arsenic	0.43			103.8
Barium	328			102.8
Cadmium	0.94			90.5
Chromium	13			
Lead	225.			
Mercury	0.01			91.8
Nickel	13.			
Selenium	<0.15			
Silver	<0.62			

TASK 2

Turn Around Time \_\_\_\_\_ days

Phenol Preservative Batch No. \_\_\_\_\_

<u>Parameter</u>	<u>Result</u> <u>(mg/l)</u>	<u>Replicate</u> <u>(mg/l)</u>	<u>Precision</u> <u>(% RSD)</u>	<u>Accuracy (% R)</u> <u>Matrix Spike</u>
Chloride				
Iron				
Manganese				
Phenols				
Sodium				
Sulfate				

EIS ENVIRONMENTAL ENGINEERS, INC.  
ANALYTICAL REPORT SHEET  
GROUNDWATER MONITORING ANALYSIS

EMB Sample C3374- SoilEIS # LP442TASK 5Turn Around Time 30 days

Date Analyzed: 5-17-88

## SURROGATE RESPONSES

Surrogate No. Solution No.	Compounds in Solution	% Recovery	QC Limits
4	. 1-bromo-2-chloroethane	99	70 - 130
	. 1,4-dichlorobutane	109	70 - 130
	. Toluene, d6	80	70 - 130
	. 1,9-decadiene	109	70 - 130

## SAMPLE RESULTS

Parameter	Result (mg/kg)	Replicate (mg/kg)	Precision (% RSD)
Acetone	4.0		
Acrolein	<10		
Acrylonitrile	<10		
Benzene	<0.1		
Bromoform	<0.1		
Bromodichloromethane	<0.1		
Bromomethane	<0.1		
Carbon Disulfide	<10		
Carbon Tetrachloride	<0.1		
Chlorobenzene	<0.1		
Chlorodibromomethane	<0.1		
Chloroethane	<0.1		
2-Chloroethylvinylether	<0.5		
Chloroform	**	<0.1	
Chloromethane	<0.1		
1,2-Dichlorobenzene	<0.1		
1,3-Dichlorobenzene	<0.1		
1,4-Dichlorobenzene	<0.1		
Dichlorodifluoromethane	<0.1		
1,1-Dichloroethane	<0.1		
1,2-Dichloroethane	<0.1		
1,1-Dichloroethene	<0.1		
t-1,2-Dichloroethene	<0.1		

\* As received basis - see Method Blank

\*\* Present but below PQL

EIS ENVIRONMENTAL ENGINEERS, INC.  
ANALYTICAL REPORT SHEET  
GROUNDWATER MONITORING ANALYSIS

EMB Sample C3374-SoilEIS # LP442

Parameter		<div>* Result (mg/kg)</div>	<div>Replicate (mg/kg)</div>	<div>Precision (% RSD)</div>
1,2-Dichloropropane	**	<0.1		
c-1,2-Dichloropropene		<0.1		
t-1,2-Dichloropropene		<0.1		
Ethylbenzene		<0.1		
Fluorotrichloromethane		<0.1		
2-Hexanone		<0.5		
Methylene Chloride	0.3			
Methyl Ethyl Ketone	7.0			
Methyl Isobutyl Ketone		<0.5		
Paraldehyde		<10		
Styrene	1.1			
1,1,2,2-Tetrachloroethane		<0.1		
Tetrachloroethylene		<0.1		
Toluene	1.6			
1,1,1-Trichloroethane	0.1			
1,1,2-Trichloroethane		<0.1		
Trichloroethylene	**	<0.1		
Vinyl Acetate		<0.5		
Vinyl Chloride		<0.1		
m-Xylene		<0.1		
o-Xylene		<0.1		
p-Xylene	0.3			
Diethyl Ether	0.9			

\* As received basis - see Method Blank

\*\* Present but below PQL

EIS ENVIRONMENTAL ENGINEERS, INC.  
ANALYTICAL REPORT SHEET  
GROUNDWATER MONITORING ANALYSISEMB Sample: C3375EIS # LP443Date Received: 5-10-88 Received By: DN Date Report Submitted: 6-10-88TASK 1Turn Around Time 30 days

Mercury Preservative Batch No. \_\_\_\_\_

Other Metal Preservative Batch No. \_\_\_\_\_

<u>Parameter</u>	<u>Result (mg/l)</u>	<u>Replicate (mg/l)</u>	<u>Precision (% RSD)</u>	<u>Accuracy (% R) Matrix Spike</u>
Arsenic	<0.01			
Barium	<0.5			
Cadmium	0.038			
Chromium	0.014			
Lead	0.81			
Mercury	0.0002			
Nickel	0.016			
Selenium	<0.005			
Silver	<0.005			

TASK 2

Turn Around Time \_\_\_\_\_ days

Phenol Preservative Batch No. \_\_\_\_\_

<u>Parameter</u>	<u>Result (mg/l)</u>	<u>Replicate (mg/l)</u>	<u>Precision (% RSD)</u>	<u>Accuracy (% R) Matrix Spike</u>
Chloride				
Iron				
Manganese				
Phenols				
Sodium				
Sulfate				

EIS ENVIRONMENTAL ENGINEERS, INC.  
ANALYTICAL REPORT SHEET  
GROUNDWATER MONITORING ANALYSIS

EMB Sample C3375EIS # LP443TASK 5Turn Around Time 30 days

Date Analyzed: 5-17-88

## SURROGATE RESPONSES

<u>Surrogate No.</u> <u>Solution No.</u>	<u>Compounds in Solution</u>	<u>% Recovery</u>	<u>QC Limits</u>
4	. 1-bromo-2-chloroethane	93	70 - 130
	. 1,4-dichlorobutane	96	70 - 130
	. Toluene, d6	108	70 - 130
	. 1,9-decadiene	99	70 - 130

## SAMPLE RESULTS

<u>Parameter</u>	<u>Result</u> <u>(<math>\mu</math>g/l)</u>	<u>Replicate</u> <u>(<math>\mu</math>g/l)</u>	<u>Precision</u> <u>(% RSD)</u>
Acetone	<10		
Acrolein	<100		
Acrylonitrile	<100		
Benzene	<1		
Bromoform	<1		
Bromodichloromethane	<1		
Bromomethane	<1		
Carbon Disulfide	<100		
Carbon Tetrachloride	<1		
Chlorobenzene	<1		
Chlorodibromomethane	<1		
Chloroethane	<1		
2-Chloroethylvinylether	<5		
Chloroform	<1		
Chloromethane	<1		
1,2-Dichlorobenzene	<1		
1,3-Dichlorobenzene	<1		
1,4-Dichlorobenzene	<1		
Dichlorodifluoromethane	<1		
1,1-Dichloroethane	<1		
1,2-Dichloroethane	<1		
1,1-Dichloroethene	<1		
t-1,2-Dichloroethene	<1		

EIS ENVIRONMENTAL ENGINEERS, INC.  
ANALYTICAL REPORT SHEET  
GROUNDWATER MONITORING ANALYSIS

EMB Sample C3375EIS # LP443

<u>Parameter</u>	<u>Result</u> <u>(<math>\mu\text{g/l}</math>)</u>	<u>Replicate</u> <u>(<math>\mu\text{g/l}</math>)</u>	<u>Precision</u> <u>(% RSD)</u>
1,2-Dichloropropane	9.7		
c-1,2-Dichloropropene	<1		
t-1,2-Dichloropropene	<1		
Ethylbenzene	<1		
Fluorotrichloromethane	<1		
2-Hexanone	<5		
Methylene Chloride	<1		
Methyl Ethyl Ketone	<5		
Methyl Isobutyl Ketone	<5		
Paraldehyde	<100		
Styrene	<1		
1,1,2,2-Tetrachloroethane	<1		
Tetrachloroethylene	<1		
Toluene	<1		
1,1,1-Trichloroethane	<1		
1,1,2-Trichloroethane	<1		
Trichloroethylene	<1		
Vinyl Acetate	<5		
Vinyl Chloride	<1		
m-Xylene	<1		
o-Xylene	<1		
p-Xylene	<1		

Confirmed by GC/MS



EIS ENVIRONMENTAL ENGINEERS, INC.  
ANALYTICAL REPORT SHEET  
GROUNDWATER MONITORING ANALYSISEMB Sample: C3376 EIS # LP444Date Received: 5-10-88 Received By: DN Date Report Submitted: 6-10-88TASK 1Turn Around Time 30 days

Mercury Preservative Batch No. \_\_\_\_\_

Other Metal Preservative Batch No. \_\_\_\_\_

<u>Parameter</u>	<u>Result</u> <u>(mg/l)</u>	<u>Replicate</u> <u>(mg/l)</u>	<u>Precision</u> <u>(% RSD)</u>	<u>Accuracy (% R)</u> <u>Matrix Spike</u>
Arsenic	<0.01			
Barium	<0.5			
Cadmium	0.035			
Chromium	0.009			
Lead	1.21			
Mercury	0.0003			
Nickel	0.017			
Selenium	<0.005			
Silver	<0.005			

TASK 2

Turn Around Time \_\_\_\_\_ days

Phenol Preservative Batch No. \_\_\_\_\_

<u>Parameter</u>	<u>Result</u> <u>(mg/l)</u>	<u>Replicate</u> <u>(mg/l)</u>	<u>Precision</u> <u>(% RSD)</u>	<u>Accuracy (% R)</u> <u>Matrix Spike</u>
Chloride				
Iron				
Manganese				
Phenols				
Sodium				
Sulfate				

EIS ENVIRONMENTAL ENGINEERS, INC.  
ANALYTICAL REPORT SHEET  
GROUNDWATER MONITORING ANALYSIS

EMB Sample C3376EIS # LP444TASK 5Turn Around Time 30 days

Date Analyzed: 5-17-88

## SURROGATE RESPONSES

<u>Surrogate No.</u> <u>Solution No.</u>	<u>Compounds in Solution</u>	<u>% Recovery</u>	<u>QC Limits</u>
4	. 1-bromo-2-chloroethane	96	70 - 130
	. 1,4-dichlorobutane	98	70 - 130
	. Toluene, d6	104	70 - 130
	. 1,9-decadiene	97	70 - 130

## SAMPLE RESULTS

<u>Parameter</u>	<u>Result</u> <u>(<math>\mu</math>g/l)</u>	<u>Replicate</u> <u>(<math>\mu</math>g/l)</u>	<u>Precision</u> <u>(% RSD)</u>
Acetone	<10		
Acrolein	<100		
Acrylonitrile	<100		
Benzene	<1		
Bromoform	<1		
Bromodichloromethane	<1		
Bromomethane	<1		
Carbon Disulfide	<100		
Carbon Tetrachloride	<1		
Chlorobenzene	<1		
Chlorodibromomethane	<1		
Chloroethane	<1		
2-Chloroethylvinylether	<5		
Chloroform	<1		
Chloromethane	<1		
1,2-Dichlorobenzene	<1		
1,3-Dichlorobenzene	<1		
1,4-Dichlorobenzene	<1		
Dichlorodifluoromethane	<1		
1,1-Dichloroethane	<1		
1,2-Dichloroethane	<1		
1,1-Dichloroethene	<1		
t-1,2-Dichloroethene	<1		

EIS ENVIRONMENTAL ENGINEERS, INC.  
ANALYTICAL REPORT SHEET  
GROUNDWATER MONITORING ANALYSIS

EMB Sample C3376EIS # LP444

Parameter	Result (mg/kg)	Replicate (mg/kg)	Precision (% RSD)
1,2-Dichloropropane	9.5		
c-1,2-Dichloropropene	<1		
t-1,2-Dichloropropene	<1		
Ethylbenzene	<1		
Fluorotrichloromethane	<1		
2-Hexanone	<5		
Methylene Chloride	<1		
Methyl Ethyl Ketone	<5		
Methyl Isobutyl Ketone	<5		
Paraldehyde	<100		
Styrene	<1		
1,1,2,2-Tetrachloroethane	<1		
Tetrachloroethylene	<1		
Toluene	<1		
1,1,1-Trichloroethane	<1		
1,1,2-Trichloroethane	<1		
Trichloroethylene	<1		
Vinyl Acetate	<5		
Vinyl Chloride	<1		
m-Xylene	<1		
o-Xylene	<1		
p-Xylene	<1		

Confirmed by GC/MS

EIS ENVIRONMENTAL ENGINEERS, INC.  
ANALYTICAL REPORT SHEET  
GROUNDWATER MONITORING ANALYSIS

EMB Sample: C3377 EIS # LP445  
Date Received: 5-10-88 Received By: DN Date Report Submitted: 6-10-88

TASK 1

Turn Around Time 30 days  
Mercury Preservative Batch No. \_\_\_\_\_  
Other Metal Preservative Batch No. \_\_\_\_\_

<u>Parameter</u>	<u>Result (mg/l)</u>	<u>Replicate (mg/l)</u>	<u>Precision (% RSD)</u>	<u>Accuracy (% R) Matrix Spike</u>
Arsenic	<0.01	<0.01	0	139.4, 138.8
Barium	<0.5	<0.5	0	103.8
Cadmium	<0.005	<0.005	0	65.0, 66.3
Chromium	<0.005	<0.005	0	89.2, 79.7
Lead	<0.005	<0.005	0	90, 90
Mercury	<0.0002	<0.0002	0	99.2, 86.6
Nickel	<0.01	<0.01	0	72.5, 75
Selenium	<0.005	<0.005	0	108.1, 103.1
Silver	<0.005	<0.005	0	70.3, 64.2

TASK 2

Turn Around Time \_\_\_\_\_ days  
Phenol Preservative Batch No. \_\_\_\_\_

<u>Parameter</u>	<u>Result (mg/l)</u>	<u>Replicate (mg/l)</u>	<u>Precision (% RSD)</u>	<u>Accuracy (% R) Matrix Spike</u>
Chloride				
Iron				
Manganese				
Phenols				
Sodium				
Sulfate				

EIS ENVIRONMENTAL ENGINEERS, INC.  
ANALYTICAL REPORT SHEET  
GROUNDWATER MONITORING ANALYSIS

EMB Sample C3377EIS # LP445TASK 5Turn Around Time 30 days

Date Analyzed: 5-17-88

## SURROGATE RESPONSES

<u>Surrogate No.</u> <u>Solution No.</u>	<u>Compounds in Solution</u>	<u>% Recovery</u>	<u>QC Limits</u>
4	. 1-bromo-2-chloroethane	90	70 - 130
	. 1,4-dichlorobutane	83	70 - 130
	. Toluene, d6	101	70 - 130
	. 1,9-decadiene	108	70 - 130

## SAMPLE RESULTS

<u>Parameter</u>	<u>Result</u> <u>(<math>\mu\text{g}/\text{l}</math>)</u>	<u>Replicate</u> <u>(<math>\mu\text{g}/\text{l}</math>)</u>	<u>Precision</u> <u>(% RSD)</u>
Acetone	<10		
Acrolein	<100		
Acrylonitrile	<100		
Benzene	<1		
Bromoform	<1		
Bromodichloromethane	<1		
Bromomethane	<1		
Carbon Disulfide	<100		
Carbon Tetrachloride	<1		
Chlorobenzene	<1		
Chlorodibromomethane	<1		
Chloroethane	<1		
2-Chloroethylvinylether	<5		
Chloroform	<1		
Chloromethane	<1		
1,2-Dichlorobenzene	<1		
1,3-Dichlorobenzene	<1		
1,4-Dichlorobenzene	<1		
Dichlorodifluoromethane	<1		
1,1-Dichloroethane	<1		
1,2-Dichloroethane	<1		
1,1-Dichloroethene	<1		
t-1,2-Dichloroethene	<1		

EIS ENVIRONMENTAL ENGINEERS, INC.  
ANALYTICAL REPORT SHEET  
GROUNDWATER MONITORING ANALYSISEMB Sample C3377EIS # LP445

<u>Parameter</u>	<u>Result (<math>\mu</math>g/l)</u>	<u>Replicate (<math>\mu</math>g/l)</u>	<u>Precision (% RSD)</u>
1,2-Dichloropropane	<1		
c-1,2-Dichloropropene	<1		
t-1,2-Dichloropropene	<1		
Ethylbenzene	<1		
Fluorotrichloromethane	<1		
2-Hexanone	<5		
Methylene Chloride	<1		
Methyl Ethyl Ketone	<5		
Methyl Isobutyl Ketone	<5		
Paraldehyde	<100		
Styrene	<1		
1,1,2,2-Tetrachloroethane	<1		
Tetrachloroethylene	<1		
Toluene	<1		
1,1,1-Trichloroethane	<1		
1,1,2-Trichloroethane	<1		
Trichloroethylene	<1		
Vinyl Acetate	<5		
Vinyl Chloride	<1		
m-Xylene	<1		
o-Xylene	<1		
p-Xylene	<1		

EIS ENVIRONMENTAL ENGINEERS, INC.  
ANALYTICAL REPORT SHEET  
GROUNDWATER MONITORING ANALYSIS

EMB Sample: C3378EIS # LP446Date Received: 5-10-88 Received By: DN Date Report Submitted: 6-10-88TASK 1Turn Around Time 30 days

Mercury Preservative Batch No. \_\_\_\_\_

Other Metal Preservative Batch No. \_\_\_\_\_

<u>Parameter</u>	<u>Result (mg/l)</u>	<u>Replicate (mg/l)</u>	<u>Precision (% RSD)</u>	<u>Accuracy (% R) Matrix Spike</u>
Arsenic	<0.01			
Barium	<0.5			
Cadmium	<0.005			
Chromium	<0.005			
Lead	0.053			
Mercury	<0.0002			
Nickel	<0.01			
Selenium	<0.005			
Silver	<0.005			

TASK 2

Turn Around Time \_\_\_\_\_ days

Phenol Preservative Batch No. \_\_\_\_\_

<u>Parameter</u>	<u>Result (mg/l)</u>	<u>Replicate (mg/l)</u>	<u>Precision (% RSD)</u>	<u>Accuracy (% R) Matrix Spike</u>
Chloride				
Iron				
Manganese				
Phenols				
Sodium				
Sulfate				

EIS ENVIRONMENTAL ENGINEERS, INC.  
ANALYTICAL REPORT SHEET  
GROUNDWATER MONITORING ANALYSIS

EMB Sample C3378EIS # LP446TASK 5Turn Around Time 30 days

Date Analyzed: 5-17-88

## SURROGATE RESPONSES

Surrogate No. Solution No.	Compounds in Solution	% Recovery	QC Limits
4	. 1-bromo-2-chloroethane	83 / 96	70 - 130
	. 1,4-dichlorobutane	103 / 94	70 - 130
	. Toluene, d6	102 / 76	70 - 130
	. 1,9-decadiene	21 / 6	70 - 130

## SAMPLE RESULTS

Parameter	Result ( $\mu\text{g/l}$ )	Replicate ( $\mu\text{g/l}$ )	Precision (% RSD)
Acetone	<10	<10	
Acrolein	<100	<100	
Acrylonitrile	<100	<100	
Benzene	<1	<1	
Bromoform	<1	<1	
Bromodichloromethane	<1	<1	
Bromomethane	<1	<1	
Carbon Disulfide	<100	<100	
Carbon Tetrachloride	<1	<1	
Chlorobenzene	<1	<1	
Chlorodibromomethane	<1	<1	
Chloroethane	<1	<1	
2-Chloroethylvinylether	<5	<5	
Chloroform	<1	<1	
Chloromethane	<1	<1	
1,2-Dichlorobenzene	<1	<1	
1,3-Dichlorobenzene	<1	<1	
1,4-Dichlorobenzene	<1	<1	
Dichlorodifluoromethane	<1	<1	
1,1-Dichloroethane	<1	<1	
1,2-Dichloroethane	<1	<1	
1,1-Dichloroethene	<1	<1	
t-1,2-Dichloroethene	<1	<1	



EIS ENVIRONMENTAL ENGINEERS, INC.  
ANALYTICAL REPORT SHEET  
GROUNDWATER MONITORING ANALYSIS

EMB Sample C3378EIS # LP446

Parameter	Result ( $\mu\text{g/l}$ )	Replicate ( $\mu\text{g/l}$ )	Precision (% RSD)
1,2-Dichloropropane	<1	<1	
c-1,2-Dichloropropene	<1	<1	
t-1,2-Dichloropropene	<1	<1	
Ethylbenzene	<1	<1	
Fluorotrichloromethane	<1	<1	
2-Hexanone	<5	<5	
Methylene Chloride	<1	<1	
Methyl Ethyl Ketone	<5	<5	
Methyl Isobutyl Ketone	<5	<5	
Paraldehyde	<100	<100	
Styrene	<1	<1	
1,1,2,2-Tetrachloroethane	<1	<1	
Tetrachloroethylene	<1	<1	
Toluene	<1	<1	
1,1,1-Trichloroethane	<1	<1	
1,1,2-Trichloroethane	<1	<1	
Trichloroethylene	<1	<1	
Vinyl Acetate	<5	<5	
Vinyl Chloride	<1	<1	
m-Xylene	<1	<1	
o-Xylene	<1	<1	
p-Xylene	<1	<1	

EIS ENVIRONMENTAL ENGINEERS, INC.  
ANALYTICAL REPORT SHEET  
GROUNDWATER MONITORING ANALYSISEMB Sample: C3379EIS # LP447Date Received: 5-10-88 Received By: DN Date Report Submitted: 6-10-88TASK 1Turn Around Time 30 days

Mercury Preservative Batch No. \_\_\_\_\_

Other Metal Preservative Batch No. \_\_\_\_\_

<u>Parameter</u>	<u>Result</u> <u>(mg/l)</u>	<u>Replicate</u> <u>(mg/l)</u>	<u>Precision</u> <u>(% RSD)</u>	<u>Accuracy (% R)</u> <u>Matrix Spike</u>
Arsenic	<0.01			
Barium	<0.5			
Cadmium	<0.005			
Chromium	<0.005			
Lead	<0.005			
Mercury	<0.0002			
Nickel	<0.01			
Selenium	<0.005			
Silver	<0.005			

TASK 2

Turn Around Time \_\_\_\_\_ days

Phenol Preservative Batch No. \_\_\_\_\_

<u>Parameter</u>	<u>Result</u> <u>(mg/l)</u>	<u>Replicate</u> <u>(mg/l)</u>	<u>Precision</u> <u>(% RSD)</u>	<u>Accuracy (% R)</u> <u>Matrix Spike</u>
Chloride				
Iron				
Manganese				
Phenols				
Sodium				
Sulfate				

EIS ENVIRONMENTAL ENGINEERS, INC.  
ANALYTICAL REPORT SHEET  
GROUNDWATER MONITORING ANALYSIS

EMB Sample C3379EIS # LP4475TASK 5Turn Around Time 30 days

Date Analyzed: 5-17-88

## SURROGATE RESPONSES

<u>Surrogate No.</u> <u>Solution No.</u>	<u>Compounds in Solution</u>	<u>% Recovery</u>	<u>QC Limits</u>
4	. 1-bromo-2-chloroethane	96	70 - 130
	. 1,4-dichlorobutane	96	70 - 130
	. Toluene, d6	92	70 - 130
	. 1,9-decadiene	98	70 - 130

## SAMPLE RESULTS

<u>Parameter</u>	<u>Result</u> <u>(<math>\mu\text{g/l}</math>)</u>	<u>Replicate</u> <u>(<math>\mu\text{g/l}</math>)</u>	<u>Precision</u> <u>(% RSD)</u>
Acetone	<10		
Acrolein	<100		
Acrylonitrile	<100		
Benzene	<1		
Bromoform	<1		
Bromodichloromethane	<1		
Bromomethane	<1		
Carbon Disulfide	<100		
Carbon Tetrachloride	<1		
Chlorobenzene	<1		
Chlorodibromomethane	<1		
Chloroethane	<1		
2-Chloroethylvinylether	<5		
Chloroform	<1		
Chloromethane	<1		
1,2-Dichlorobenzene	<1		
1,3-Dichlorobenzene	<1		
1,4-Dichlorobenzene	<1		
Dichlorodifluoromethane	<1		
1,1-Dichloroethane	<1		
1,2-Dichloroethane	<1		
1,1-Dichloroethene	<1		
t-1,2-Dichloroethene	<1		

EIS ENVIRONMENTAL ENGINEERS, INC.  
ANALYTICAL REPORT SHEET  
GROUNDWATER MONITORING ANALYSISEMB Sample C3379EIS # LP447

<u>Parameter</u>	<u>Result</u> <u>(<math>\mu</math>g/l)</u>	<u>Replicate</u> <u>(<math>\mu</math>g/l)</u>	<u>Precision</u> <u>(% RSD)</u>
1,2-Dichloropropane	<1		
c-1,2-Dichloropropene	<1		
t-1,2-Dichloropropene	<1		
Ethylbenzene	<1		
Fluorotrichloromethane	<1		
2-Hexanone	<5		
Methylene Chloride	<1		
Methyl Ethyl Ketone	<5		
Methyl Isobutyl Ketone	<5		
Paraldehyde	<100		
Styrene	<1		
1,1,2,2-Tetrachloroethane	<1		
Tetrachloroethylene	<1		
Toluene	<1		
1,1,1-Trichloroethane	<1		
1,1,2-Trichloroethane	<1		
Trichloroethylene	<1		
Vinyl Acetate	<5		
Vinyl Chloride	<1		
m-Xylene	<1		
o-Xylene	<1		
p-Xylene	<1		

EIS ENVIRONMENTAL ENGINEERS, INC.  
ANALYTICAL REPORT SHEET  
GROUNDWATER MONITORING ANALYSIS

EMB Sample: C3380EIS # LP448Date Received: 5-10-88 Received By: DN Date Report Submitted: 6-10-88TASK 1Turn Around Time 30 days

Mercury Preservative Batch No. \_\_\_\_\_

Other Metal Preservative Batch No. \_\_\_\_\_

<u>Parameter</u>	<u>Result (mg/l)</u>	<u>Replicate (mg/l)</u>	<u>Precision (% RSD)</u>	<u>Accuracy (% R) Matrix Spike</u>
Arsenic	<0.01			
Barium	<0.5			
Cadmium	<0.005			
Chromium	<0.005			
Lead	<0.005			
Mercury	<0.0002			
Nickel	<0.01			
Selenium	<0.005			
Silver	<0.005			

TASK 2

Turn Around Time \_\_\_\_\_ days

Phenol Preservative Batch No. \_\_\_\_\_

<u>Parameter</u>	<u>Result (mg/l)</u>	<u>Replicate (mg/l)</u>	<u>Precision (% RSD)</u>	<u>Accuracy (% R) Matrix Spike</u>
Chloride				
Iron				
Manganese				
Phenols				
Sodium				
Sulfate				

EIS ENVIRONMENTAL ENGINEERS, INC.  
ANALYTICAL REPORT SHEET  
GROUNDWATER MONITORING ANALYSIS

EMB Sample C3380EIS # LP448TASK 5Turn Around Time 30 days

Date Analyzed: 5-17-88

## SURROGATE RESPONSES

Surrogate No. Solution No.	Compounds in Solution	% Recovery	QC Limits
4	. 1-bromo-2-chloroethane	92	70 - 130
	. 1,4-dichlorobutane	99	70 - 130
	. Toluene, d6	100	70 - 130
	. 1,9-decadiene	99	70 - 130

## SAMPLE RESULTS

Parameter	Result (mg/kg)	Replicate (mg/kg)	Precision (% RSD)
Acetone	<10		
Acrolein	<100		
Acrylonitrile	<100		
Benzene	<1		
Bromoform	<1		
Bromodichloromethane	<1		
Bromomethane	<1		
Carbon Disulfide	<100		
Carbon Tetrachloride	<1		
Chlorobenzene	<1		
Chlorodibromomethane	<1		
Chloroethane	<1		
2-Chloroethylvinylether	<5		
Chloroform	1.1		
Chloromethane	<1		
1,2-Dichlorobenzene	<1		
1,3-Dichlorobenzene	<1		
1,4-Dichlorobenzene	<1		
Dichlorodifluoromethane	<1		
1,1-Dichloroethane	<1		
1,2-Dichloroethane	<1		
1,1-Dichloroethene	<1		
t-1,2-Dichloroethene	<1		

Note: Chloroform may be a laboratory air contaminant.

EIS ENVIRONMENTAL ENGINEERS, INC.  
ANALYTICAL REPORT SHEET  
GROUNDWATER MONITORING ANALYSIS

EMB Sample C3380EIS # LP448

<u>Parameter</u>	<u>Result</u> <u>(<math>\mu</math>g/l)</u>	<u>Replicate</u> <u>(<math>\mu</math>g/l)</u>	<u>Precision</u> <u>(% RSD)</u>
1,2-Dichloropropane	<1		
c-1,2-Dichloropropene	<1		
t-1,2-Dichloropropene	<1		
Ethylbenzene	<1		
Fluorotrichloromethane	<1		
2-Hexanone	<5		
Methylene Chloride	<1		
Methyl Ethyl Ketone	<5		
Methyl Isobutyl Ketone	<5		
Paraldehyde	<100		
Styrene	<1		
1,1,2,2-Tetrachloroethane	<1		
Tetrachloroethylene	<1		
Toluene	<1		
1,1,1-Trichloroethane	<1		
1,1,2-Trichloroethane	<1		
Trichloroethylene	<1		
Vinyl Acetate	<5		
Vinyl Chloride	<1		
m-Xylene	<1		
o-Xylene	<1		
p-Xylene	<1		

EIS ENVIRONMENTAL ENGINEERS, INC.  
QUALITY ASSURANCE DATA SHEET - NONORGANIC ANALYSIS

EMB Samples: C3373-C3380  
EIS Lab Number: LP441-LP448

The data shown on this sheet pertain to deionized water spikes or USEPA EMSL analysis, Method Blanks and sample parameter analysis dates.

Sample Matrix Spike analysis, if performed, as well as sample Duplicate analysis results, are reported on the individual sample result sheets.

Type of Spike (% Recovery): Deionized Water \_\_\_\_\_ USEPA EMSL ☒

<u>Parameter</u>	<u>% Recovery</u>	<u>Method Blank (mg/l)</u>	<u>Analysis Date</u>
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Total Cyanide

Total Sulfide

<u>Arsenic</u>	107.9	<0.01	6-6-88
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<u>Barium</u>	105	<0.5	5-29-88
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<u>Cadmium</u>	110.5	<0.005	5-26-88
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<u>Chromium</u>	101.1	<0.005	6-6-88
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<u>Lead</u>	88.9	<0.005	5-27-88
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<u>Mercury</u>	81.6	<0.0002	5-23-88
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<u>Selenium</u>	100.3	<0.005	6-6-88
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<u>Silver</u>	118.6	<0.005	6-8-88
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<u>Nickel</u>	95.8	<0.01	6-6-88
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Chloride

Iron

Manganese

Phenols

Sodium

Sulfate

pH

Specific Conductance

TOC

TOH

Total Residue



EIS ENVIRONMENTAL ENGINEERS, INC.  
 QUALITY ASSURANCE DATA SHEET  
 VOLATILE ORGANIC COMPOUNDS

Parameter	Concentration	
	<u>µg/l</u>	<u>mg/kg</u>
1,2-Dichloropropane	<1	
c-1,2-Dichloropropene	<1	
t-1,2-Dichloropropene	<1	
Ethylbenzene	<1	
Fluorotrichloromethane	<1	
2-Hexanone	<5	
Methylene Chloride	<1	
Methyl Ethyl Ketone	<5	
Methyl Isobutyl Ketone	<5	
Paraldehyde	<100	
Styrene	<1	
1,1,2,2-Tetrachloroethane	<1	
Tetrachloroethylene	<1	
Toluene	<1	
1,1,1-Trichloroethane	<1	
1,1,2-Trichloroethane	<1	
Trichloroethylene	<1	
Vinyl Acetate	<5	
Vinyl Chloride	<1	
m-Xylene	<1	
o-Xylene	<1	
p-Xylene	<1	

\* Present but below PQL

EIS ENVIRONMENTAL ENGINEERS, INC.  
QUALITY ASSURANCE DATA SHEET  
VOLATILE ORGANIC COMPOUNDS

QC Description: Method Blank-Water  
 EMB Sample Group: C3375 - C3380  
 EIS Lab Numbers: LP443-LP448  
 Date Analyzed: 5-17-88

**SURROGATE RESPONSES**

Surrogate No. Solution No.	Compounds in Solution	% Recovery	QC Limits
4	. 1-bromo-2-chloroethane	98	70 - 130
	. 1,4-dichlorobutane	100	70 - 130
	. Toluene, d6	108	70 - 130
	. 1,9-decadiene	105	70 - 130

**SAMPLE RESULTS**

Parameter	Concentration $\mu\text{g/l}$	$\text{mg/kg}$
Acetone	<10	
Acrolein	<100	
Acrylonitrile	<100	
Benzene	<1	
Bromoform	<1	
Bromodichloromethane	<1	
Bromomethane	<1	
Carbon Disulfide	<100	
Carbon Tetrachloride	<1	
Chlorobenzene	<1	
Chlorodibromomethane	<1	
Chloroethane	<1	
2-Chloroethylvinylether	<5	
Chloroform	<1	
Chloromethane	<1	
1,2-Dichlorobenzene	<1	
1,3-Dichlorobenzene	<1	
1,4-Dichlorobenzene	<1	
Dichlorodifluoromethane	<1	
1,1-Dichloroethane	<1	
1,2-Dichloroethane	<1	
1,1-Dichloroethene	<1	
t-1,2-Dichloroethene	<1	

\* Present but below PQL.

EIS ENVIRONMENTAL ENGINEERS, INC.  
 QUALITY ASSURANCE DATA SHEET  
 VOLATILE ORGANIC COMPOUNDS

QC Description: Method Blank-Soils  
 EMB Sample Group: C3373, C3374  
 EIS Lab Numbers: LP441, LP442  
 Date Analyzed: 5-17-88

**SURROGATE RESPONSES**

<u>Surrogate No.</u>	<u>Solution No.</u>	<u>Compounds in Solution</u>	<u>% Recovery</u>	<u>QC Limits</u>
	4	. 1-bromo-2-chloroethane	95	70 - 130
		. 1,4-dichlorobutane	96	70 - 130
		. Toluene, d6	104	70 - 130
		. 1,9-decadiene	106	70 - 130

**SAMPLE RESULTS**

<u>Parameter</u>	<u>Concentration</u> <u>mg/kg</u>
Acetone	3.7
Acrolein	<10
Acrylonitrile	<10
Benzene	<0.1
Bromoform	<0.1
Bromodichloromethane	<0.1
Bromomethane	<0.1
Carbon Disulfide	<10
Carbon Tetrachloride	<0.1
Chlorobenzene	<0.1
Chlorodibromomethane	<0.1
Chloroethane	<0.1
2-Chloroethylvinylether	<0.5
Chloroform	* <0.1
Chloromethane	<0.1
1,2-Dichlorobenzene	<0.1
1,3-Dichlorobenzene	<0.1
1,4-Dichlorobenzene	<0.1
Dichlorodifluoromethane	<0.1
1,1-Dichloroethane	<0.1
1,2-Dichloroethane	<0.1
1,1-Dichloroethene	<0.1
t-1,2-Dichloroethene	<0.1

\* Present but below the applicable PQL

EIS ENVIRONMENTAL ENGINEERS, INC.  
 QUALITY ASSURANCE DATA SHEET  
 VOLATILE ORGANIC COMPOUNDS

Parameter	Concentration mg/kg
1,2-Dichloropropane	<0.1
c-1,2-Dichloropropene	<0.1
t-1,2-Dichloropropene	<0.1
Ethylbenzene	<0.1
Fluorotrichloromethane	<0.1
2-Hexanone	<0.5
Methylene Chloride	0.16
Methyl Ethyl Ketone	5.2
Methyl Isobutyl Ketone	<0.5
Paraldehyde	<10
Styrene	0.7
1,1,2,2-Tetrachloroethane	<0.1
Tetrachloroethylene	<0.1
Toluene	0.9
1,1,1-Trichloroethane	*
1,1,2-Trichloroethane	<0.1
Trichloroethylene	*
Vinyl Acetate	<0.5
Vinyl Chloride	<0.1
m-Xylene	<0.1
o-Xylene	<0.1
p-Xylene	0.2
Ethyl Ether	0.9

\* Present but below the applicable PQL.

#### NOTES

1. The mg/kg values assume the average soil weight from the two samples and identical aliquots for analysis.
2. The methanol contained impurities higher than those normally associated with high purity methanol. It appears that external contamination may have occurred. All responses in the blank were also present in the samples. The only real sample was 1,2 Dichloropropane.

EIS ENVIRONMENTAL ENGINEERS, INC.  
 QUALITY ASSURANCE DATA SHEET  
 VOLATILE ORGANIC COMPOUNDS  
 Check Standard Continuation

Parameter	Actual $\mu\text{g/l}$	Recovered $\mu\text{g/l}$	Recovery %
1,2-Dichloropropane	10.0	9.3	93
c-1,2-Dichloropropene			
t-1,2-Dichloropropene			
Ethylbenzene	10.7	9.6	90
Fluorotrichloromethane			
2-Hexanone	40.1	31.2	78
Methylene Chloride	13.4	10.4	78
Methyl Ethyl Ketone	62.1	51.6	83
Methyl Isobutyl Ketone	36.2	26.3	73
Paraldehyde			
Styrene	11.0	11.3	103
1,1,2,2-Tetrachloroethane			
Tetrachloroethylene	10.4	9.2	88
Toluene	10.3	8.6	83
1,1,1-Trichloroethane	8.9	10.8	121
1,1,2-Trichloroethane	11.5	10.6	87
Trichloroethylene	9.9	9.0	91
Vinyl Acetate	56.8	62.2	110
Vinyl Chloride	9.0	7.8	87
m-Xylene			
o-Xylene	14.1	11.6	82
p-Xylene	13.2	11.7	89
Trichlorofluoromethane	2.5	2.2	88
Tetrahydrofuran	69.9	37.9	54
2-Chlorotoluene	11.5	11.5	100
4-Chlorotoluene	11.4	11.6	102

EIS ENVIRONMENTAL ENGINEERS, INC.  
 QUALITY ASSURANCE DATA SHEET  
 VOLATILE ORGANIC COMPOUNDS

QC Description: Check Standard  
 EMB Sample Group: C3373-C3380  
 EIS Lab Numbers: LP441-LP448  
 Date Analyzed: 5-17-88

**SURROGATE RESPONSES**

<u>Surrogate No.</u> <u>Solution No.</u>	<u>Compounds in Solution</u>	<u>% Recovery</u>	<u>QC Limits</u>
4	. 1-bromo-2-chloroethane	98	70 - 130
	. 1,4-dichlorobutane	91	70 - 130
	. Toluene, d6	85	70 - 130
	. 1,9-decadiene	98	70 - 130

**SAMPLE RESULTS**

<u>Parameter</u>	<u>Actual <math>\mu\text{g/l}</math></u>	<u>Recovered <math>\mu\text{g/l}</math></u>	<u>Recovery %</u>
Acetone	53.7	63.6	118
Acrolein			
Acrylonitrile			
Benzene	10.7	8.8	82
Bromoform	10.9	10.0	92
Bromodichloromethane	11.1	10.7	96
Bromomethane			
Carbon Disulfide			
Carbon Tetrachloride	9.1	8.6	88
Chlorobenzene	11.9	11.8	99
Chlorodibromomethane	11.6	11.9	103
Chloroethane	11.0	9.9	90
2-Chloroethylvinylether			
Chloroform	9.5	11.0	116
Chloromethane			
1,2-Dichlorobenzene	11.7	11.2	96
1,3-Dichlorobenzene			
1,4-Dichlorobenzene	16.0	16.0	100
Dichlorodifluoromethane			
1,1-Dichloroethane	9.1	8.5	94
1,2-Dichloroethane	10.9	9.0	83
1,1-Dichloroethene	9.2	9.4	102
t-1,2-Dichloroethene	9.4	7.4	79
c-1,2 Dichloroethene	9.5	8.6	91

EIS ENVIRONMENTAL ENGINEERS, INC.  
 QUALITY ASSURANCE DATA SHEET  
 VOLATILE ORGANIC COMPOUNDS

QC Description: Duplicate Matrix Spike  
 EMB Sample Group: C3373-C3380  
 EIS Lab Numbers: LP441-LP448

Matrix: C3377  
 Date Analyzed: 5-17-88

#### SURROGATE RESPONSES

<u>Surrogate No.</u>	<u>Solution No.</u>	<u>Compounds in Solution</u>	<u>% Recovery</u>	<u>QC Limits</u>
4	.	1-bromo-2-chloroethane	101 / 95	70 - 130
	.	1,4-dichlorobutane	85 / 83	70 - 130
	.	Toluene, d6	80 / 87	70 - 130
	.	1,9-decadiene	114 / 107	70 - 130

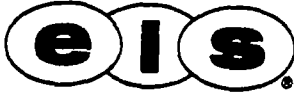
#### SAMPLE RESULTS

<u>Parameter</u>	<u>Spike Level</u> <u>ug/l</u>	<u>Back-ground</u> <u>ug/l</u>	<u>Amount Recovered</u> <u>ug/l</u>		<u>Recovery Data</u>	
			<u>#1</u>	<u>#2</u>	<u>%R</u>	<u>RPD</u>
Acetone						
Acrolein						
Acrylonitrile						
Benzene	3.6	ND	3.2	2.6	81	21
Bromoform	6.6	ND	6.5	6.3	97	3.1
Bromodichloromethane						
Bromomethane						
Carbon Disulfide						
Carbon Tetrachloride						
Chlorobenzene	3.9	ND	4.1	3.7	100	10
Chlorodibromomethane						
Chloroethane						
2-Chloroethylvinylether	39.7	ND	ND	ND	0	0
Chloroform						
Chloromethane						
1,2-Dichlorobenzene						
1,3-Dichlorobenzene						
1,4-Dichlorobenzene						
Dichlorodifluoromethane						
1,1-Dichloroethane	3.1	ND	2.2	2.4	74	8.7
1,2-Dichloroethane						
1,1-Dichloroethene						
t-1,2-Dichloroethene						

EIS ENVIRONMENTAL ENGINEERS, INC.  
 QUALITY ASSURANCE DATA SHEET  
 VOLATILE ORGANIC COMPOUNDS  
 Duplicate Matrix Spike Continuation

Parameter	Spike Level ug/l	Back- ground ug/l	Amount Recovered ug/l		Recovery Data	
			#1	#2	%R	RPD
1,2-Dichloropropane	3.5	ND	3.8	3.7	107	2.7
c-1,2-Dichloropropene						
t-1,2-Dichloropropene						
Ethylbenzene						
Fluorotrichloromethane						
2-Hexanone						
Methylene Chloride						
Methyl Ethyl Ketone						
Methyl Isobutyl Ketone						
Paraldehyde						
Styrene						
1,1,2,2-Tetrachloroethane	6.2	ND	7.4	7.1	117	4.1
Tetrachloroethylene						
Toluene						
1,1,1-Trichloroethane						
1,1,2-Trichloroethane						
Trichloroethylene						
Vinyl Acetate						
Vinyl Chloride						
m-Xylene						
o-Xylene						
p-Xylene						





June 10, 1988

Mr. Gregory A. Busch  
Quality Assurance Officer  
Department of Environmental Management  
105 South Meridian  
Indianapolis, IN 46225

Subject: EMB Samples C 3373-C3380

Dear Greg:

Enclosed please find results for the subject samples. Tasks 1 and 5 were requested by your field people. However, two of the samples are soils. Although we have reported the results on our groundwater contract result sheets, we have invoiced against the solid waste contract. 30 days turn-around was required.

The corresponding EIS Lab #'s are LP441-LP448.

A copy of our "chain-of-custody" document plus chromatograms and applicable QA material is enclosed.

Sincerely,

EIS ENVIRONMENTAL ENGINEERS, INC.

  
Andris Rozite  
Vice President

AR/njt

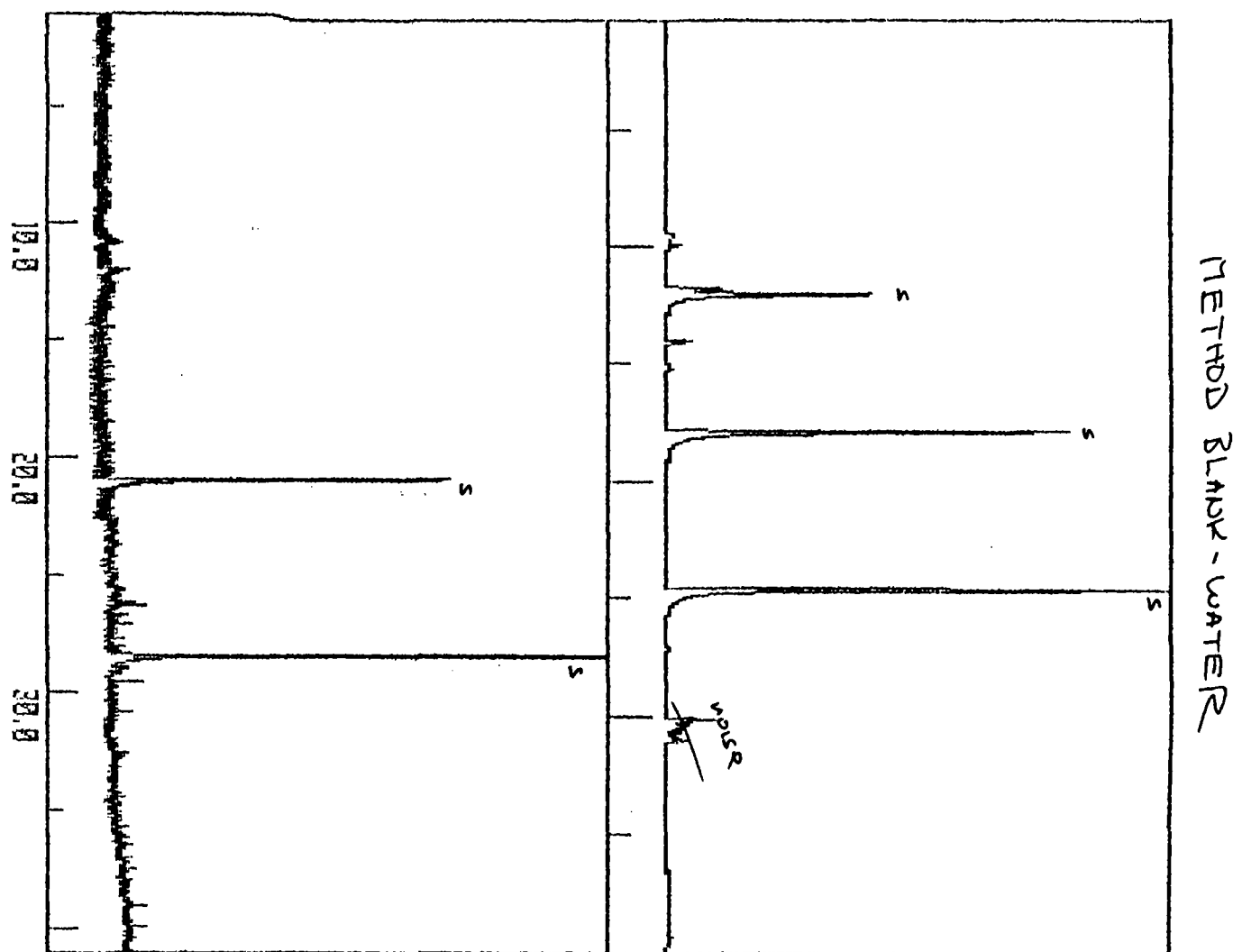
From 0 min To 40 min

Channel A: PID

Channel B: HECD

Range = 2 mV Offset = 4.865 mV

Range = 65 mV    Offset = -2.346 mV



Sample Name DI (5m1+SUR)

Date: 17 May 1988

10:49

Method: VOCAEXm

Operator: NJM

Interface: 706

Cycle#: 5

Channel#: A

Vial#: -1

NOTE: The Data Was Stored In File VPID 5:,702

\*\*\*\*\* EXTERNAL STANDARD REPORT \*\*\*\*\*

Data From Sample DI (5ml+SUR) Collected on 17 May 1988 10:49  
Delay Time : 0.00 Run Time : 40.00  
Area Reject = 200 uV-sec Sampling Rate = 2.49 pts/sec  
Bunch Factor = 2 pts  
Noise Threshold = 2 uV Area Threshold = 50 uV-sec  
Sample Amount = 1 ug/l Injection Vol = 12  
Dilution Factor = 1 Multiplier Amount = 1.0000

Peak Num	Ret Time	Peak Name	Concentration as ug/l	Raw Area	Area Ratio	Cal Range	Peak Type	Ref Peak	% Delta Ret Time	Response Ratio
1	13.50	UNKNOWN	3.93960	473	788	-	1	-		200.0000
3	20.01	S#1 TOLUENE d6	107.55175	7744	12906	-	1	9	-.0561	120.0000
5	22.23	UNKNOWN	3.41700	246	410	-	1	-		120.0000
6	25.25	UNKNOWN	6.24549	450	749	-	2	-		120.0000
8	27.21	UNKNOWN	2.88938	208	347	-	1	-		120.0000
9	27.51	S#2 1,9-DECADIENE	104.51665	12542	20903	Over	1	9	0	200.0000

Total Amount = 224.62026

Sample Name DI (5ml+SUR)

Date: 17 May 1988 10:49 Method: VOCBEXm Operator: NJM  
Interface: 706 Cycle#: 5 Channel#: B Vial#: -1

NOTE: The Data Was Stored In File VECD 5:,702

\*\*\*\*\* EXTERNAL STANDARD REPORT \*\*\*\*\*

Data From Sample DI (5ml+SUR) Collected on 17 May 1988 10:49  
Delay Time : 0.00 Run Time : 40.00  
Area Reject = 4000 uV-sec Sampling Rate = 2.49 pts/sec  
Bunch Factor = 2 pts  
Noise Threshold = 2 uV Area Threshold = 200 uV-sec  
Sample Amount = 1 ug/l Injection Vol = 1  
Dilution Factor = 1 Multiplier Amount = 1.0000

Peak Num	Ret Time	Peak Name	Concentration as ug/l	Raw Area	Area Ratio	Cal Range	Peak Type	Ref Peak	% Delta Ret Time	Response Ratio
1	9.58	UNKNOWN	2.92707	16040	16040	-	2	-		5480.0000
2	9.97	UNKNOWN	3.02514	16578	16578	-	2	-		5480.0000
3	11.88	Methylene Chloride	.92715	52793	52793	Under	2	4	-.1456	56941.7476
4	12.10	S#1 1,1,2-TRICHLOROTRIFLUOR	6.11601	239937	239937	-	2	8	.04906	39230.9318
5	14.10	Chloroform	.45923	26076	26076	Under	1	4	-.0615	56781.9118
7	15.26	1,1,1-Trichloroethane	.32694	7310	7310	Under	2	4	-.0199	22359.2391
8	17.96	S#2 1-BROMO-2-CHLOROETHAN	98.26405	419588	419588	-	1	8	0	4270.0000
9	24.67	S#3 1,4-DICHLOROBUTANE	99.78308	546811	546811	-	1	8	.03681	5480.0000
11	30.13	UNKNOWN	3.33150	18257	18257	-	1	-		5480.0000
14	30.65	UNKNOWN	1.28332	7033	7033	-	1	-		5480.0000
16	30.99	UNKNOWN	1.61886	8871	8871	-	1	-		5480.0000

Total Amount = 212.11013

Sequence Recorded in VOCs: ,700,0,0

Real Time Chromatogram of MB (1/50 MeOH/DI)+SU From 0 min To 40 min

Channel A: PID

Channel B: HEC

Range = 2 mV Offset = 4.865 mV

Range = 65 mV Offset = -2.362 mV



METHOD BLANK-SOILS

=====

Sample Name MB (1/50 MeOH/DI)+SU

Date: 18 May 1988 00:50 Method: VOCAEXm Operator: NJM  
Interface: 706 Cycle#: 20 Channel#: A Vial#: -1

=====

NOTE: The Data Was Stored In File VPID 20:,702

\*\*\*\*\* EXTERNAL STANDARD REPORT \*\*\*\*\*

Data From Sample MB (1/50 MeOH/DI)+SU Collected on 18 May 1988 00:50

Delay Time : 0.00

Run Time : 40.00

Area Reject = 200 uV-sec Sampling Rate = 2.49 pts/sec

Bunch Factor = 2 pts

Noise Threshold = 2 uV

Area Threshold = 50 uV-sec

Sample Amount = 1 ug/l

Injection Vol = 12

Dilution Factor = 1

Multiplier Amount = 1.0000

Peak Num	Ret Time	Peak Name	Concentration as ug/l	Raw Area	Area Ratio	Cal Range	Peak Type	Ref Peak	% Delta Ret Time	Response Ratio
1	9.81	UNKNOWN	63.06040	7567	12612	-	1	-		200.0000
2	10.98	Acetone	51.25129	2178	3631	-	1	9	-.5185	70.8417
3	11.55	Ethyl Ether	12.33604	2542	4237	-	1	9	.15060	343.4716
4	13.25	Methyl Ethyl Ketone	72.13611	4707	7845	-	1	9	-.1845	108.7578
5	15.48	1,1-Dichloropropene	3.05813	468	780	-	1	9	-.1819	255.0183
6	16.55	UNKNOWN	2.17669	333	555	-	1	-		255.0183
7	16.88	UNKNOWN	4.49262	687	1146	-	1	-		255.0183
8	19.23	UNKNOWN	4.23909	649	1081	-	1	-		255.0183
9	19.95	S#1 TOLUENE d6	104.05379	7492	12486	-	1	12	-.0355	120.0000
10	21.17	UNKNOWN	3.89158	280	467	-	1	-		120.0000
11	25.71	Bromobenzene	.99748	438	730	Under	1	12	-.1801	732.1429
12	27.42	S#2 1,9-DECADIENE	105.85665	12703	21171	Over	1	12	0	200.0000
13	30.27	UNKNOWN	4.83740	580	967	-	1	-		200.0000

Total Amount = 369.32687

Sample Name MB (1/50 MeOH/DI)+SU

Date: 18 May 1988

00:50

Method: VOCBEXm

Operator: NJM

Interface: 706

Cycle#: 20

Channel#: B

Vial#: -1

NOTE: The Data Was Stored In File VECD 20:,702

\*\*\*\*\* EXTERNAL STANDARD REPORT \*\*\*\*\*

Data From Sample MB (1/50 MeOH/DI)+SU Collected on 18 May 1988 00:50

Delay Time : 0.00

Run Time : 40.00

Area Reject = 4000 uV-sec Sampling Rate = 2.49 pts/sec

Bunch Factor = 2 pts

Noise Threshold = 2 uV

Area Threshold = 200 uV-sec

Sample Amount = 1 ug/l

Injection Vol = 1

Dilution Factor = 1

Multiplier Amount = 1.0000

Peak Num	Ret Time	Peak Name	Concentration as ug/l	Raw Area	Area Ratio	Cal Range	Peak Type	Ref Peak	% Delta Ret Time	Response Ratio
1	9.46	UNKNOWN	.34406	15765	15765	-	1	-		45819.5164
2	9.86	UNKNOWN	1.60371	73481	73481	-	1	-		45819.5164
3	11.72	Methylene Chloride	2.24587	131255	131255	-	2	0	.05662	58443.0600
4	11.94	UNKNOWN S#1 Lab Freon	5.13227	299946	299946	-	2	-		58443.0600
5	14.05	UNKNOWN Chloroform	.20334 < 1	11884	11884	-	2	-		58443.0600
7	15.21	1,1,1-Trichloroethane	.58200	13013	13013	Under	2	0	1.0821	22359.2391
9	17.90	S#2 1-BROMO-2-CHLOROETHAN	95.36306	407200	407200	-	1	9	0	4270.0000
11	24.60	1,1,2,2-Tetrachloroethane	14.53178	528377	528377	-	1	0	-.1459	45819.5164

5480

STANDARD

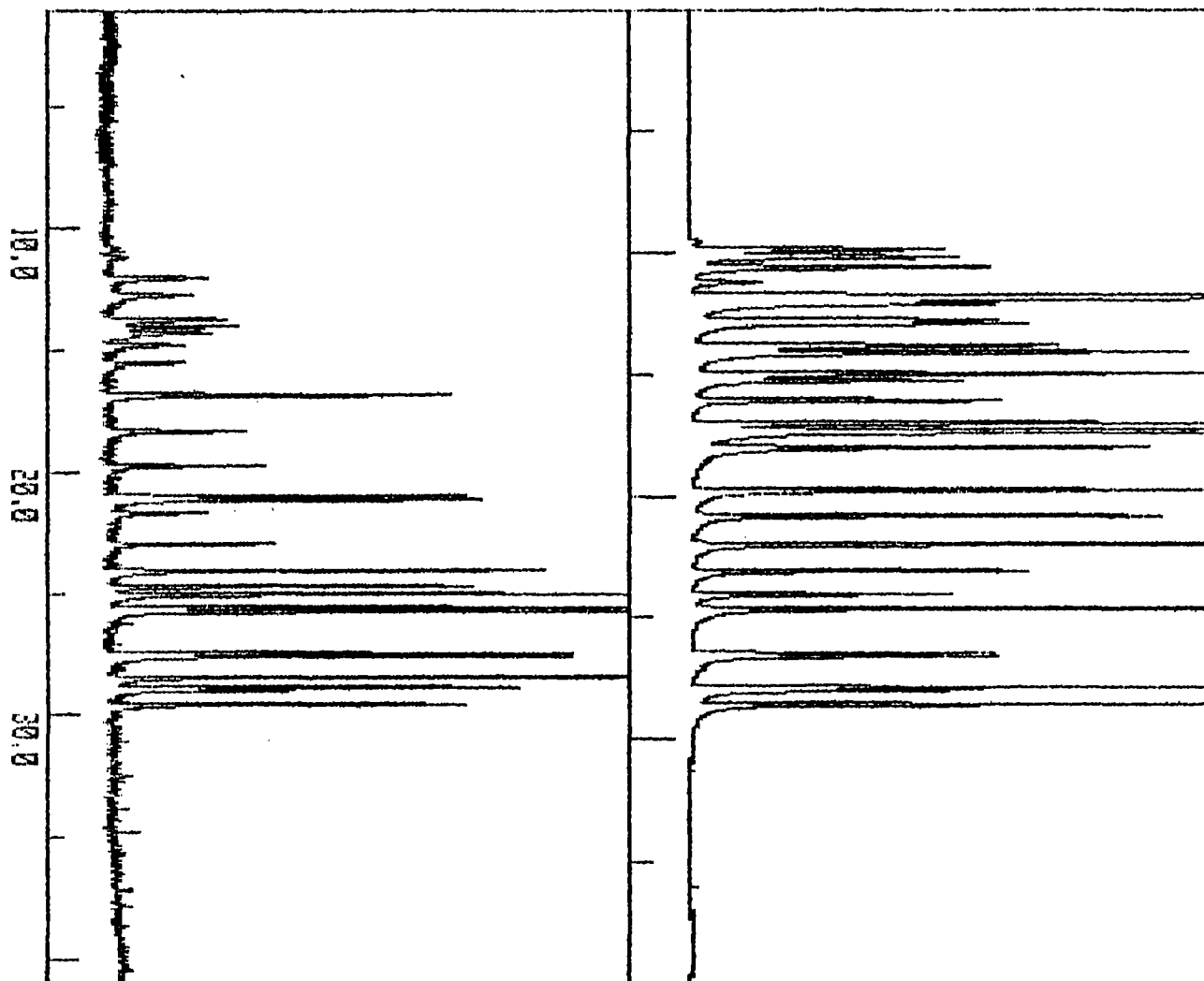
Real Time Chromatogram of ST 0420+0517+gas(L2) From 0 min To 40 min

Channel A: PID

Channel B: HECD

Range = 2 mV Offset = 4.878 mV

Range = 65 mV Offset = -2.332 mV



Sample Name ST 0420+0517+gas(L2)

Date: 17 May 1988

11:31

Method: VOCAEXm

Operator: NJM

Interface: 706

Cycle#: 7

Channel#: A

Vial#: -1

NOTE: The Data Was Stored In File VPID 7:702

\*\*\*\*\* EXTERNAL STANDARD REPORT \*\*\*\*\*

Data From Sample ST 0420+0517+gas(L2) Collected on 17 May 1988 11:31

Delay Time : 0.00

Run Time : 40.00

Area Reject = 200 uV-sec Sampling Rate = 2.49 pts/sec

Bunch Factor = 2 pts

Noise Threshold = 2 uV Area Threshold = 50 uV-sec

Sample Amount = 1 ug/l Injection Vol = 12

Dilution Factor = 1 Multiplier Amount = 1.0000

Peak	Ret	Peak	Concentration as	Raw	Area	Cal	Peak	Ref	% Delta	Response
------	-----	------	------------------	-----	------	-----	------	-----	---------	----------

Run	line	Name	ug/l	Area	Ratio	Range	Type	Peak	Ret Time	Ratio
1	6.32	UNKNOWN	.29941	240	399	-	1	10		1333.6854
2	10.19	Vinyl Chloride	7.80809	572	953	-	1	13	-.3840	122.1054
3	11.05	Acetone	63.64785	2762	4586	-	1	13	-.1065	72.0551
4	11.76	1,1-Dichloroethylene	9.39875	2531	4218	-	1	13	-.2094	448.7458
5	12.75	1,2-Dichloroethylene	7.40347	3620	6034	-	2	13	-.1553	815.0246
6	13.01	Vinyl Acetate	62.17191	3026	5044	-	2	13	-.1758	81.1265
7	13.29	Methyl Ethyl Ketone	51.61454	3233	5389	-	2	13	-.0786	104.4015
8	13.79	c-1,2-Dichloroethylene	7.65026	2106	3509	-	1	13	-.0325	458.7371
9	14.51	Tetrahydrofuran	37.85393	1560	2600	-	1	13	-.0730	68.6922
10	15.84	Benzene	8.81805	7056	11761	-	1	13	-.0369	1333.6854
11	17.32	Trichloroethylene	9.01649	3236	5394	-	1	13	.00451	598.1818
12	18.72	Methyl Isobutyl Ketone	26.33651	2869	4782	-	1	13	.05881	181.5651
13	19.99	881 TOLUENE d6	85.35698	6146	10243	-	2	26	.05901	120.0000
14	20.15	Toluene	8.57823	7947	13245	-	2	13	-.0025	1544.0735
15	20.68	2-Hexanone	31.23860	1969	3282	-	1	13	.00737	105.0515
16	21.23	UNKNOWN	.31850	255	425	-	1	10		1333.6854
17	21.96	Tetrachloroethylene	8.00965	2734	4556	-	1	26	.06939	568.8137
18	23.05	Chlorobenzene	11.09041	7987	13312	-	1	26	.03090	1200.3375
19	23.71	Ethyl Benzene	9.56807	6292	10486	-	2	26	.03491	1095.9238
20	24.03	m+p-Xylene	11.69702	9954	16591	-	2	26	.02321	1418.3805
21	24.58	Styrene	11.33093	8073	13455	-	2	26	.01430	1187.4717
22	24.74	o-Xylene	11.55958	9495	15825	-	2	26	.01392	1368.9705
23	25.21	UNKNOWN	.33694	312	520	-	1	14		1544.0735
24	26.46	2-Chlorotoluene	11.02429	6623	11039	-	2	26	.00325	1001.3090
25	26.60	4-Chlorotoluene **	11.11588	8532	14220	-	2	26	-.0014	1279.2890
26	27.45	882 1,9-DECADECENE	97.88030	11746	19576	Under	1	26	0	200.0000
27	27.86	1,3-Dichlorobenzene	7.79581	6076	10127	-	2	26	-.0064	1298.9727
28	27.99	1,4-Dichlorobenzene	6.77262	3933	6555	-	2	26	-.0034	967.9341
29	28.56	1,2-Dichlorobenzene	12.11820	6366	10610	-	1	26	-.0134	875.5523
30	31.47	UNKNOWN	.39530	366	610	-	1	14		1544.0735

Total Amount = 627.90718

Sample Name ST 0420+0517+gas(L2)

Date: 17 May 1988 11:31 Method: VOCBEXm Operator: NJM  
Interface: 706 Cycle#: 7 Channel#: B Vial#: -1

NOTE: The Data Was Stored In File UECD 7:702

\*\*\*\*\* EXTERNAL STANDARD REPORT \*\*\*\*\*

Data From Sample ST 0420+0517+gas(L2) Collected on 17 May 1988 11:31

Delay Time : 0.00

Run Time : 40.00

Area Reject = 4000 uV-sec Sampling Rate = 2.49 pts/sec

Bunch Factor = 2 pts

Noise Threshold = 2 uV Area Threshold = 200 uV-sec

Sample Amount = 1 ug/l Injection Vol = 1

Dilution Factor = 1 Multiplier Amount = 1.0000

Peak Num	Ret Time	Peak Name	Concentration as ug/l	Raw Area	Area Ratio	Cal Range	Peak Type	Ref Peak	% Delta Ret Time	Response Ratio
1	9.59	UNKNOWN	.23735	7995	7995	-	1	-		33686.2326
2	9.88	UNKNOWN DiChloro DiFluoro methane	5.27460 16.4	177684	177684	-	1	-		33686.2326
3	10.20	Vinyl Chloride	4.51660	104380	104380	-	1	7	-.6183	23110.2391
4	10.62	Chloroethane	9.87075	278428	278428	-	1	7	-.6295	28207.3411
5	11.22	Trichlorofluoromethane	2.23566	68261	68261	-	1	7	-.5925	30532.9356
6	11.87	Methylene Chloride + H DCE	17.58332	1148248	1148248	-	2	7	-.2823	65303.2612
7	12.11	SM 1,1,2-TRICHLOROTRIFLUOR	11.53068	367866	367866	-	2	17	.09053	31903.2754
8	12.77	t-1,2-Dichloroethylene 250	6.94026	247630	247630	-	2	7	-.0048	35680.2387
9	12.91	1,1-Dichloroethane	8.48040	319761	319761	-	2	7	-.0796	37705.8346
10	13.80	c-1,2-dichloroethylene	8.56978	380363	380363	-	2	7	-.1092	44384.2273
11	14.10	Chloroform	11.00364	560016	560016	-	2	7	-.1133	50893.7389
12	14.97	1,2-Dichloroethane	8.98040	451081	451081	-	2	7	-.0307	50229.5289
13	15.27	1,1,1-Trichloroethane	10.79771	256449	256449	-	2	7	-.0379	23750.2934
14	16.08	Carbon Tetrachloride	8.56861	273380	273380	-	2	17	-.0075	31904.8440
15	16.98	1,2-Dichloropropane	9.31899	377082	377082	-	2	17	-.0056	40463.8468
16	17.32	Trichloroethylene + BrCl2CH	20.23137	1054721	1054721	-	2	17	-.1629	52132.9418
17	17.96	SM 1-BROMO-2-CHLOROETHAN	98.05688	418703	418703	-	2	17	0	4270.0000
18	19.74	1,1,2-Trichloroethane	10.62004	552096	552096	-	1	17	-.0013	51986.2720
19	20.81	Chlorodibromomethane	11.85938	358146	358146	-	2	17	-.0528	30199.4117
21	21.98	Tetrachloroethylene	9.23435	556827	556827	-	1	24	.04543	60299.4967
22	23.08	Chlorobenzene	11.76548	243228	243228	-	1	24	.03069	20672.9870
23	24.84	Bromoform	10.02531	189445	189445	-	1	24	.04081	18896.6314
24	24.63	SM 1,1-DICHLOROBUTANE	91.05450	498979	498979	-	1	17	-.1211	5480.0000
25	26.49	2-Chlorotoluene	11.46593	167538	167538	-	2	24	-.0048	14611.8103
26	26.63	4-Chlorotoluene	11.64795	234735	234735	-	3	24	-.0086	20152.4967
27	27.10	UNKNOWN	.66413	13384	13384	-	4	-		20152.4967
28	27.89	1,3-Dichlorobenzene	9.83975	284440	284440	-	2	24	-.0206	28907.2092
29	28.01	1,4-Dichlorobenzene	6.19202	217249	217249	-	2	24	-.0575	35085.2836
30	28.58	1,2-Dichlorobenzene	11.21532	377802	377802	-	2	24	-.0539	33686.2326

Total Amount = 432,26920



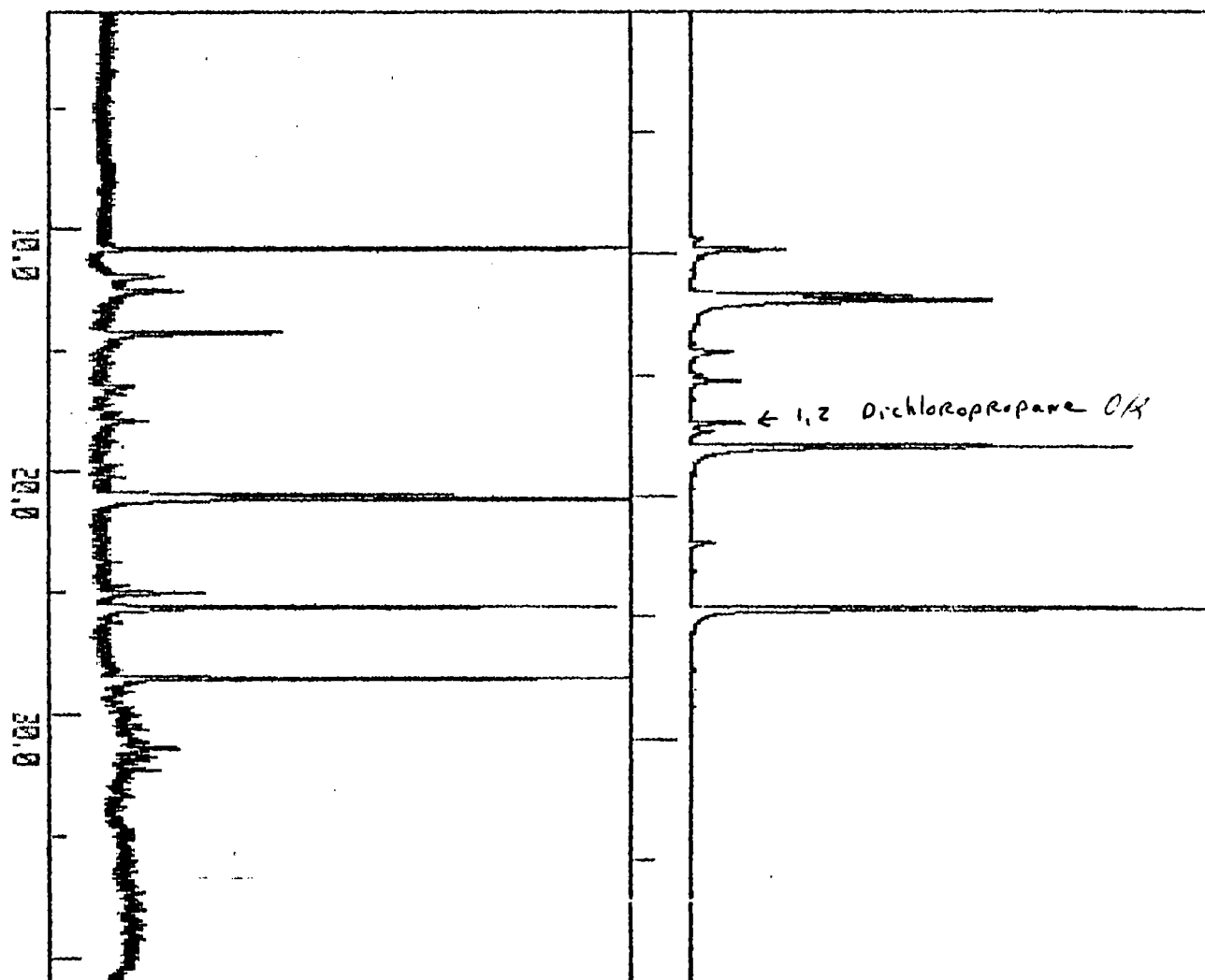
Real Time Chromatogram of LP441 (1/50) C3373 From 0 min To 40 min

Channel A: PID

Channel B: HECD

Range = 2 mV Offset = 4.905 mV

Range = 65 mV Offset = -2.34 mV



Sample Name LP441 (1/50) C3373

Date: 18 May 1988

02:46

Method: VOCAEX

Operator: NJM

Interface: 706

Cycle#: 22

Channel#: A

Vial#: -1

1	9.83 UNKNOWN	7.10548	7024	11706	-	1	9		1647.4475
2	10.96 Acetone	44.41384	1903	3171	-	1	8	-.8533	71.3991
3	11.57 Ethyl Ether	9.85374	1862	3104	-	1	8	.12715	314.9893
4	13.27 Methyl Ethyl Ketone	68.56264	4451	7418	-	1	8	-.1997	108.1868
5	15.46 UNKNOWN	.97890	968	1613	-	1	9		1647.4475
6	16.93 UNKNOWN	1.25423	1240	2066	-	1	9		1647.4475
7	18.72 Methyl Isobutyl Ketone	7.20168	492	820	-	1	8	.07913	113.0269
8	19.99 S81 TOLUENE d6	85.37497	6147	10245	-	2	12	-.1320	120.0000
9	20.14 Toluene	19.52237	19297	32162	-	2	8	-.0157	1647.4475
10	24.04 m+p-Xylene	3.46806	2611	4352	-	1	12	-.0802	1254.8765
11	24.61 Styrene	12.52147	9603	16004	-	1	12	-.0266	1278.1474
12	27.49 S82 1,9-DECADIENE	100.86012	12103	20172	Over	1	12	0	200.0000
13	28.52 UNKNOWN	.40344	399	665	-	1	9		1647.4475
14	28.70 UNKNOWN	.22897	226	377	-	1	9		1647.4475
15	28.94 UNKNOWN	.28529	282	470	-	1	9		1647.4475
16	29.58 UNKNOWN	.56306	557	928	-	1	9		1647.4475
17	29.97 UNKNOWN	.34935	345	576	-	1	9		1647.4475
18	30.37 UNKNOWN	.67897	671	1119	-	1	9		1647.4475
19	30.73 UNKNOWN	.90185	891	1486	-	2	9		1647.4475
20	30.86 UNKNOWN	.40183	397	662	-	2	9		1647.4475
21	31.22 UNKNOWN	.56428	558	930	-	1	9		1647.4475
22	36.24 UNKNOWN	.71659	708	1181	-	1	9		1647.4475

Total Amount = 360.13514

Sample Name LP441 (1/50) C3373

Date: 18 May 1988 02:46 Method: VOCBEXm Operator: NJM  
Interface: 706 Cycle#: 22 Channel#: B Vial#: -1

NOTE: The Data Was Stored In File VECD 22:702

\*\*\*\*\* EXTERNAL STANDARD REPORT \*\*\*\*\*  
Data From Sample LP441 (1/50) C3373 Collected on 18 May 1988 02:46  
Delay Time : 0.00 Run Time : 40.00  
Area Reject = 4000 uV-sec Sampling Rate = 2.49 pts/sec

Bunch Factor = 2 pts  
Noise Threshold = 2 uV Area Threshold = 200 uV-sec  
Sample Amount = 1 ug/l Injection Vol = 1  
Dilution Factor = 1 Multiplier Amount = 1.0000

Peak Num	Ret Time	Peak Name	Concentration as ug/l	Raw Area	Area Ratio	Cal Range	Peak Type	Ref Peak	X Delta Ret Time	Response Ratio
1	9.47	UNKNOWN	.28987	13191	13191	-	1	-		45505.4590
2	9.88	UNKNOWN	1.67458	76202	76202	-	1	-		45505.4590
3	11.74	Methylene Chloride	3.40804	218514	218514	-	2	0	.13752	64117.2692
4	11.95	UNKNOWN <i>Sum#1-Lab Floor</i>	6.01034	385366	385366	-	2	-		64117.2692
6	14.06	UNKNOWN <i>Chloroform</i>	.67463 < 1	43448	43448	-	2	-		64117.2692
7	14.97	1,1,1-Trichloroethane <i>UNKNOWN</i>	.44523	9955	9955	Under	2	0	-.6267	22359.2391
8	15.24	UNKNOWN <i>1,1,2-Trichloroethane</i>	2.18643	48887	48887	-	2	-		22359.2391
10	16.96	1,2-Dichloropropane	1.22244	43666	43666	Under	2	12	.06066	35719.9501
11	17.33	Trichloroethylene	.53414	23163	23163	Under	2	12	.20914	43364.6870
12	17.93	S82 1-BROMO-2-CHLOROETHAN	102.72470	438634	438634	-	1	12	0	4270.0000
15	21.99	Tetrachloroethylene	.33757	17667	17667	Under	1	0	-.0804	52337.4441
17	24.67	1,1,2,2-Tetrachloroethane <i>UNKNOWN</i>	12.37416	563092	563092	-	1	0	-.1459	45505.4590
18	27.17	UNKNOWN	.12633	5749	5749	-	1	-		45505.4590

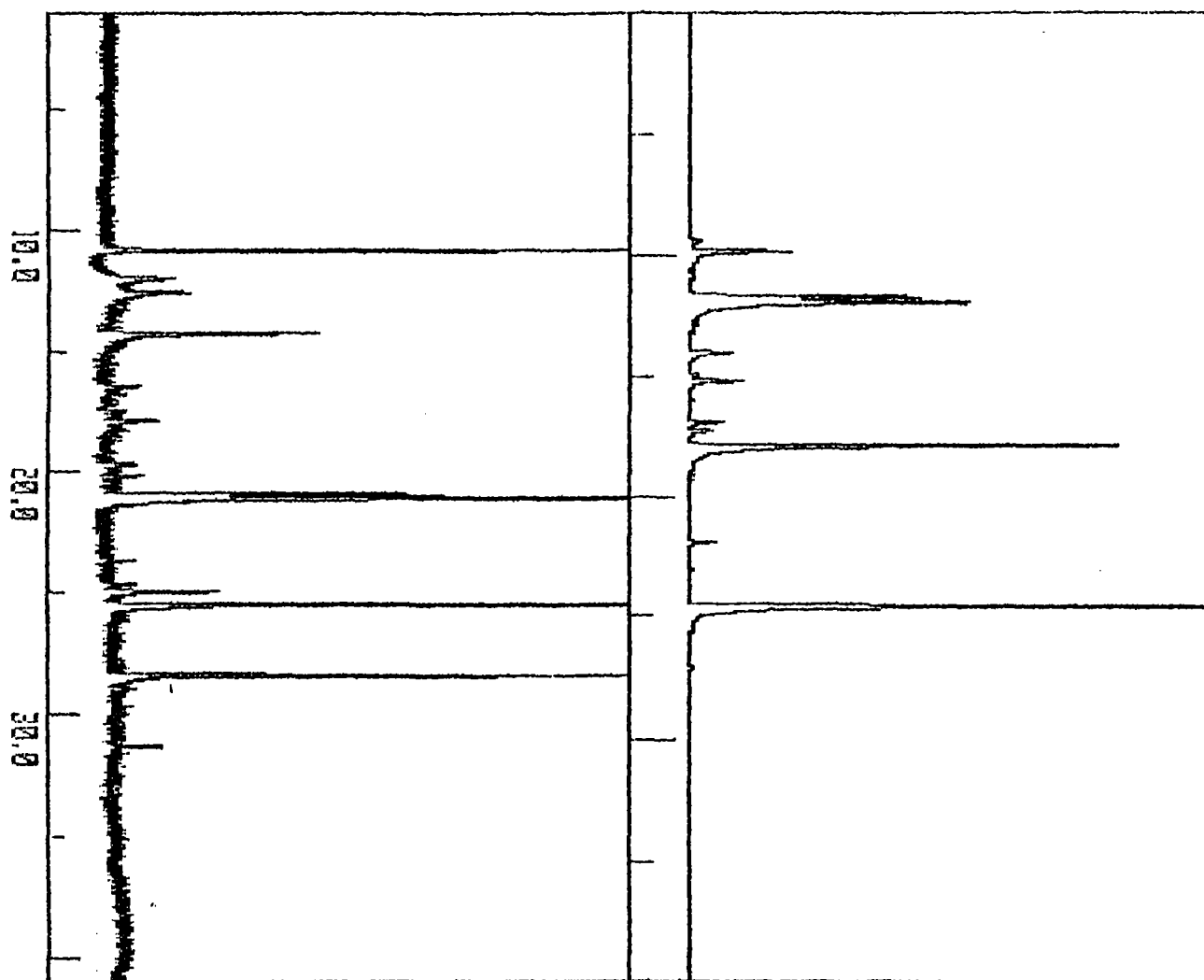
Real Time Chromatogram of LP442 (1/50) C3374 From 0 min To 40 min

Channel A: PID

Channel B: HECD

Range = 2 mV Offset = 4.88 mV

Range = 65 mV Offset = -2.352 mV



=====

Sample Name LP442 (1/50) C3374

Date: 18 May 1988 03:43 Method: VOCAEXm Operator: NJM  
Interface: 706 Cycle#: 23 Channel#: A Vial#: -1

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Peak Num	Ret Time	Peak Name	Concentration as ug/l	Raw Area	Area Ratio	Cal Range	Peak Type	Ref Peak	X Delta Ret Time	Response Ratio
1	9.82	UNKNOWN	7.66739	7575	12625	-	1	10		1646.6458
2	10.96	Acetone	49.50704	2108	3513	-	1	9	-.7307	70.9693
3	11.56	Ethyl Ether	10.84358	2133	3556	-	1	9	.24586	327.9073
4	13.26	Methyl Ethyl Ketone	87.14352	5785	9642	-	1	9	-.0989	110.6447
5	15.46	1,1-Dichloropropene	2.97243	448	746	-	1	9	-.3523	251.1009
6	16.88	UNKNOWN	1.39278	1376	2293	-	1	10		1646.6458
7	18.74	Methyl Isobutyl Ketone	10.85488	946	1576	-	1	9	.35018	145.2042
8	19.23	UNKNOWN	.82639	816	1361	-	1	10		1646.6458
9	19.95	S#1 TOLUENE d6	79.70247	5739	9564	-	2	15	-.0096	120.0000
10	20.10	Toluene	19.41694	19184	31973	-	2	9	-.0184	1646.6458
11	22.73	UNKNOWN	.38288	378	630	-	1	10		1646.6458
12	23.70	Ethyl Benzene	1.41588	794	1323	Under	1	15	.12877	934.5794
13	23.98	m+p-Xylene	3.12676	2336	3893	-	1	15	-.0545	1244.9630
14	24.55	Styrene	13.20582	10482	17470	-	1	15	.02022	1322.8696
15	27.41	S#2 1,9-DECADIENE	104.49655	12540	20899	Over	1	15	0	200.0000
16	30.27	UNKNOWN	.97165	960	1600	-	1	10		1646.6458
17	39.42	UNKNOWN	.26712	264	440	-	1	10		1646.6458

Total Amount = 384.92996

Sample Name LP442 (1/50) C3374

Date: 18 May 1988 03:43 Method: VOCBEXm Operator: NJM  
Interface: 706 Cycle#: 23 Channel#: B Vial#: -1

NOTE: The Data Was Stored In File VECD 23:702

\*\*\*\*\* EXTERNAL STANDARD REPORT \*\*\*\*\*  
Data From Sample LP442 (1/50) C3374 Collected on 18 May 1988 03:43  
Delay Time : 0.00 Run Time : 40.00  
Area Reject = 4000 uV-sec Sampling Rate = 2.49 pts/sec  
Bunch Factor = 2 pts  
Noise Threshold = 2 uV Area Threshold = 200 uV-sec  
Sample Amount = 1 ug/l Injection Vol = 1  
Dilution Factor = 1 Multiplier Amount = 1.0000

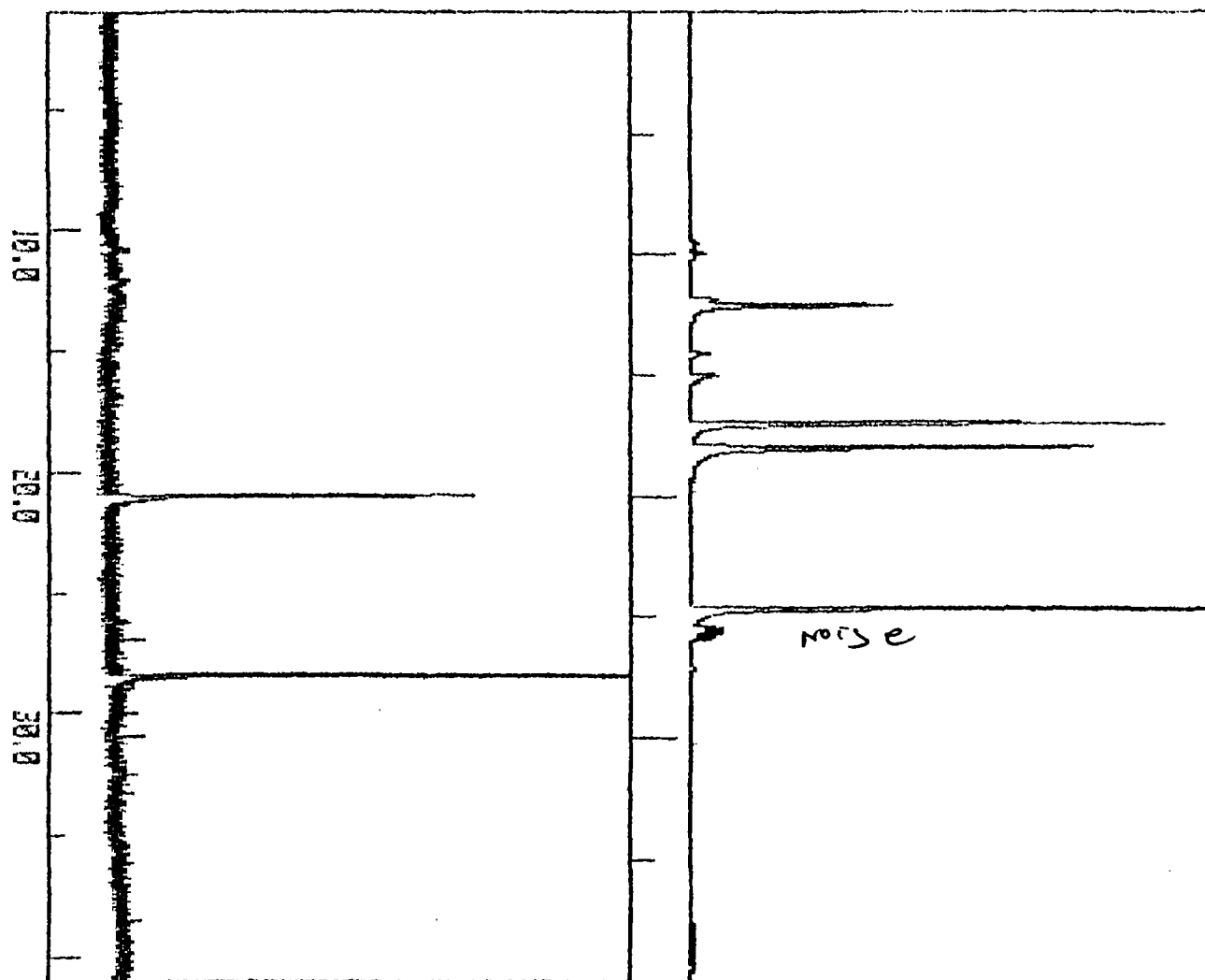
Peak Num	Ret Time	Peak Name	Concentration as ug/l	Raw Area	Area Ratio	Cal Range	Peak Type	Peak	X Delta Ret Time	Response Ratio
1	9.46	UNKNOWN	.22087	9956	9956	-	1	-		45075.0574
2	9.86	UNKNOWN	1.91112	86144	86144	-	3	-		45075.0574
3	10.22	UNKNOWN	.16511	7442	7442	-	4	-		45075.0574
4	11.74	Methylene Chloride	3.58133	231526	231526	-	2	0	.24101	64647.8641
5	11.94	UNKNOWN Lab FREON-S#5	5.83251	377059	377059	-	2	-		64647.8641
6	14.05	UNKNOWN chloroform	.69321	44815	44815	-	1	-		64647.8641
7	14.97	1,1,1-Trichloroethane	.31538	7052	7052	Under	2	0	-.5569	22359.2391
8	15.21	UNKNOWN III Trichloroethane	1.98279	44334	44334	-	2	-		22359.2391
10	16.94	1,2-Dichloropropane	.77691	27751	27751	Under	2	12	.09090	35719.9501
11	17.30	Trichloroethylene	.53796	23328	23328	Under	2	12	.24607	43364.6870
12	17.98	S#2 1-BROMO-2-CHLOROETHANE	98.72640	421562	421562	-	1	12	0	4270.0000
15	21.95	Tetrachloroethylene	.39392	20617	20617	Under	1	0	-.0346	52337.4441
17	24.60	1,1,2,2-Tetrachloroethane	13.27044	598164	598164	-	1	0	-.1459	45075.0574
18	27.10	UNKNOWN	.10249	4620	4620	-	1	-		45075.0574

Total Amount = 126.21330

Real  
Active  
Label

5480

Real Time Chromatogram of LP443 (5ml) C3375 From 0 min To 40 min  
Channel A: PID Channel B: HECD  
Range = 2 mV Offset = 4.861 mV Range = 65 mV Offset = -2.332 mV



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Sample Name LP443 (5ml) C3375

Date: 17 May 1988 15:12 Method: VOCAEXm Operator: NJM  
Interface: 706 Cycle#: 10 Channel#: A Vial#: -1

=====

NOTE: The Data Was Stored In File VP10 10:,702

\*\*\*\*\* EXTERNAL STANDARD REPORT \*\*\*\*\*

Data From Sample LP443 (5ml) C3375 Collected on 17 May 1988 15:12

Delay Time : 0.00

Run Time : 40.00

Area Reject = 200 uV-sec Sampling Rate = 2.49 pts/sec

Bunch Factor = 2 pts

Noise Threshold = 2 uV

Area Threshold = 50 uV-sec

Sample Amount = 1 ug/l

Injection Vol = 12

Dilution Factor = 1

Multiplier Amount = 1.0000

Peak Num	Ret Time	Peak Name	Concentration as ug/l	Raw Area	Area Ratio	Cal Range	Peak Type	Ref Peak	% Delta Ret Time	Response Ratio
1	19.73	UNKNOWN	3.70842	445	742	-	2	-		200.0000
2	20.00	SM1 TOLUENE d6	108.10314	7784	12973	-	2	4	.09769	120.0000
3	25.21	UNKNOWN	4.72350	340	567	-	1	-		120.0000
4	27.45	SM2 1,9-DECADIENE	99.08630	11890	19817	Under	1	4	0	200.0000
5	31.48	UNKNOWN	2.97145	357	594	-	1	-		200.0000

Total Amount = 214.89039

Sample Name LP443 (5ml) C3375

Date: 17 May 1988 15:12

Method: VOCBEXm

Operator: NJM

Interface: 706

Cycle#: 10

Channel#: B

Vial#: -1

NOTE: The Data Was Stored In File VECD 10:,702

\*\*\*\*\* EXTERNAL STANDARD REPORT \*\*\*\*\*

Data From Sample LP443 (5ml) C3375 Collected on 17 May 1988 15:12

Delay Time : 0.00

Run Time : 40.00

Area Reject = 4000 uV-sec Sampling Rate = 2.49 pts/sec

Bunch Factor = 2 pts

Noise Threshold = 2 uV

Area Threshold = 200 uV-sec

Sample Amount = 1 ug/l

Injection Vol = 1

Dilution Factor = 1

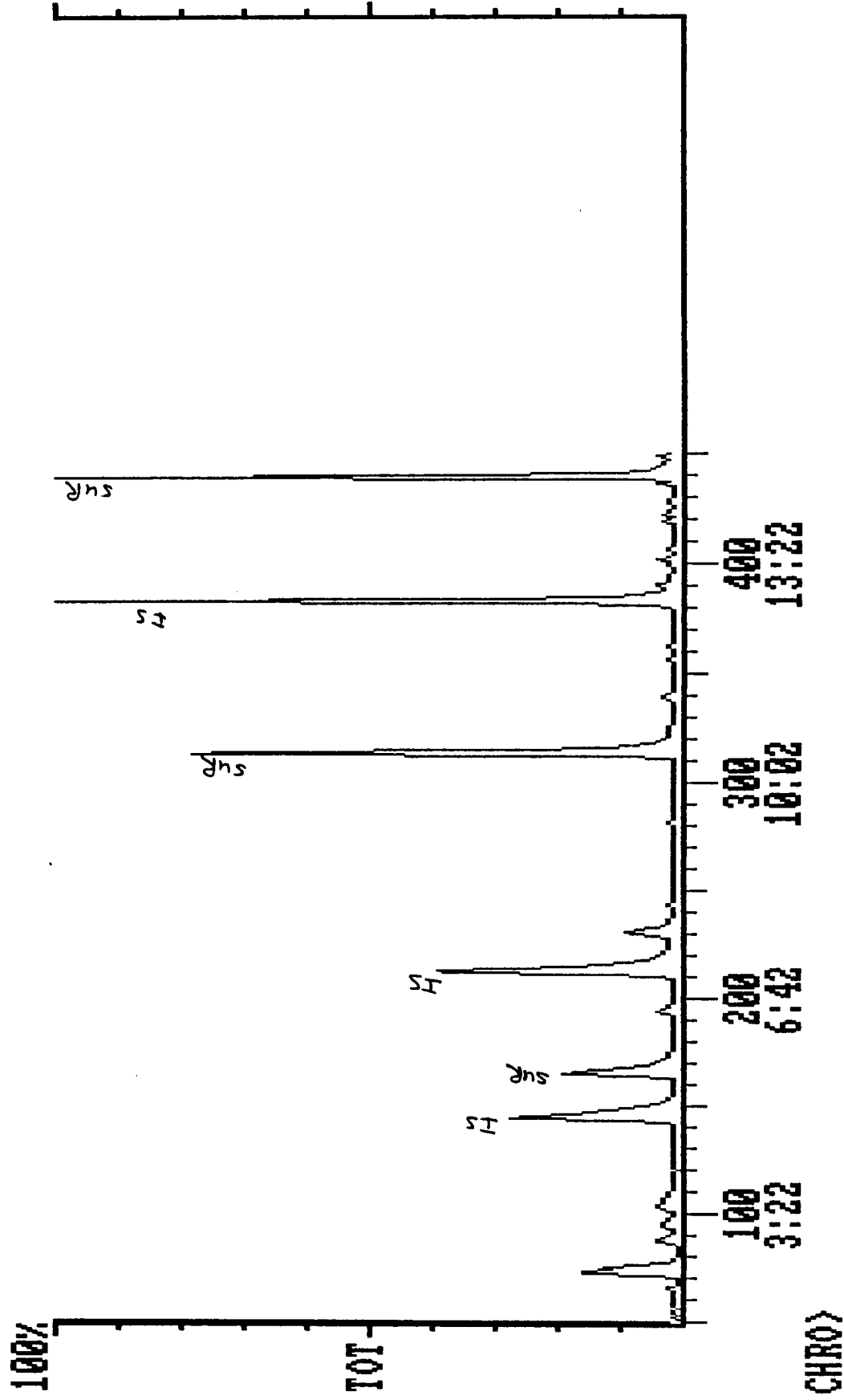
Multiplier Amount = 1.0000

Peak Num	Ret Time	Peak Name	Concentration as ug/l	Raw Area	Area Ratio	Cal Range	Peak Type	Ref Peak	% Delta Ret Time	Response Ratio
1	9.63	UNKNOWN	1.50143	10887	10887	-	2	-		7251.2712
2	10.00	UNKNOWN	1.89077	13710	13710	-	2	-		7251.2712
3	11.91	Methylene Chloride	.40886	23281	23281	Under	2	4	.04404	56941.7476
4	12.14	SM1 1,1,2-TRICHLOROTRIFLUOR	6.11423	239897	239897	-	2	8	.23420	39235.7976
5	14.13	Chloroform	.34619	19658	19658	Under	1	4	-.0225	56781.9118
6	15.03	1,2-Dichloroethane	.53302	26915	26915	Under	1	4	.17718	50495.2830
7	16.99	1,2-Dichloropropane	9.65334	391062	391062	-	1	8	.04287	40510.4757
8	17.96	SM2 1-BROMO-2-CHLOROETHAN	93.42682	398933	398933	-	1	8	0	4270.0000
11	24.63	SM3 1,4-DICHLOROBUTANE	95.52056	523453	523453	-	1	8	.02366	5480.0000
12	25.44	UNKNOWN	.83899	4598	4598	-	1	-		5480.0000
14	25.72	Bromobenzene } noise	.69193	5017	5017	Under	1	11	-.2762	7251.2712

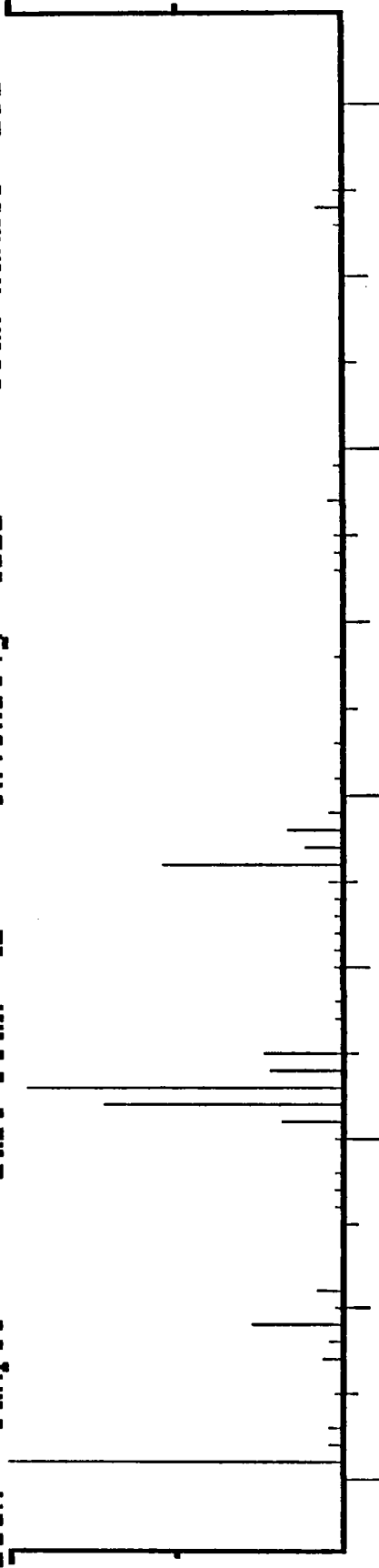
Total Amount = 207.53395

Chromatogram  
Comment: EMB C3375 (5ml + SUR/IS)  
Scan Range: 50 - 450 Scan: 50

Acquired: Jun-07-1988 07:58:14  
Int = 3223 @ 1:42 RIC: 100% =386364



Library Search \DATA\LP443 Acquired: Jun-07-1988 07:58:14 + 7:44  
Comment: EMB C3375 (5ml + SUR/IS) MID  
100% Sample Base Peak 41 Intensity 4022 Scan number 231



100% 1,2-DICHLOROPROPANE

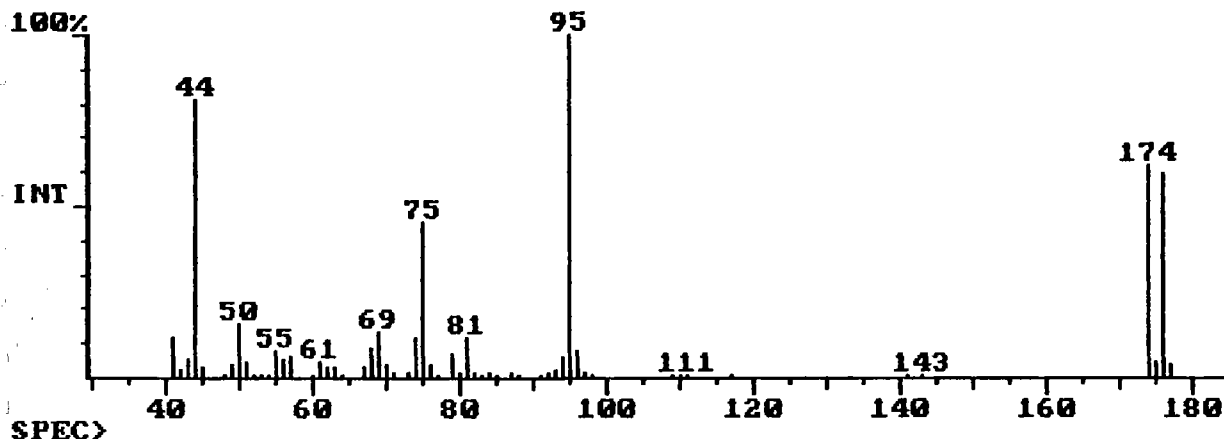


Formula: C3.H6.CL2  
Molecular weight 112 Purity 740 Fit 798 Rfit 928 Rank 1 Index 21  
VOCDLB (Purity, mass range 36 - 120, weight range 0 - 500) Cas# 0-00-0



BFB

Spectrum # 438 Filename: LP443 Acquired: Jun-07-1988 07:58:14 + 14:3  
 Comment: EMB C3375 (5ml + SUR/IS) MID  
 Base Pk: 95 Int: 3965 Range: 41-177 RIC: 22154 100.00% = 3965  
 AGC time: 7734



Mass List # 438 Filename: LP443 Acquired: Jun-07-1988 07:58:14 + 14:3  
 Comment: EMB C3375 (5ml + SUR/IS) MID  
 Base Pk: 95 Int: 3965 #Pk: 57 Range: 41-177 Thrsh: 100 RIC: 22154

Mass	Intensity	% Base	Mass	Intensity	% Base	Mass	Intensity	% Base
41	486	12.26	68	354	8.93	88	54	1.38
42	122	3.08	69	547	13.80	91	38	0.97
43	234	5.93	70	173	4.38	92	67	1.70
44	3,234	81.57	71	67	1.70	93	96	2.44
45	131	3.33	73	86	2.19	94	270	6.82
49	180	4.55	74	466	11.77	95	3,965	100.00
50	646	16.31	75	1,812	45.70	96	331	8.36
51	202	5.11	76	177	4.46	97	77	1.95
55	328	8.28	77	38	0.97	98	41	1.06
56	225	5.68	79	305	7.71	111	57	1.46
57	276	6.98	80	77	1.95	117	41	1.06
60	51	1.30	81	469	11.85	143	48	1.22
61	189	4.79	82	83	2.11	174	2,462	62.09
62	151	3.81	83	51	1.30	175	196	4.95
63	144	3.65	84	64	1.62	176	2,372	59.82
67	138	3.49	87	70	1.79	177	173	4.38

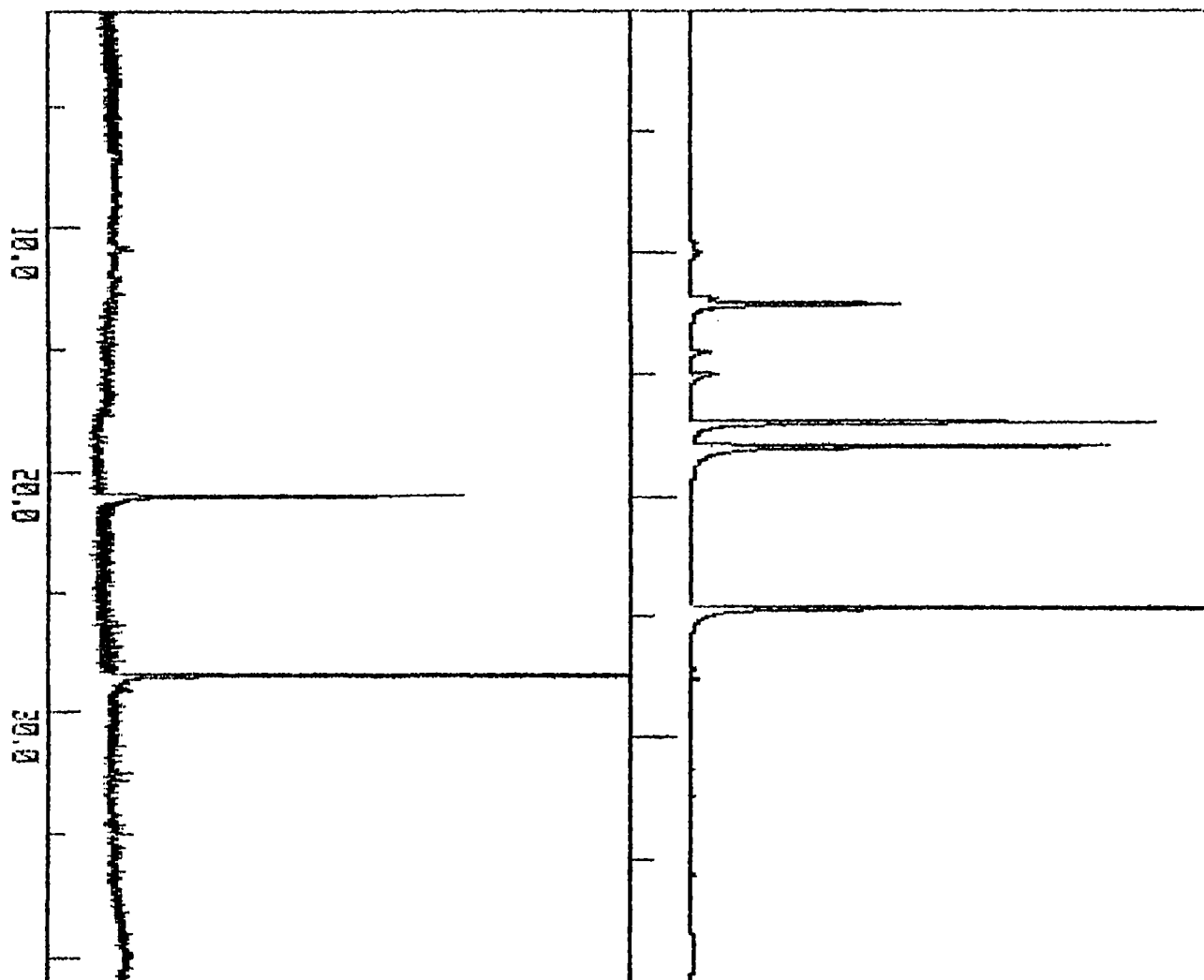
MLST&gt;

Log File Filename: LP443 Acquired: Jun-07-1988 At: 07:58:14 (7:58 am)  
 Comment: EMB C3375 (5ml + SUR/IS) MID  
 Total Run Time: 20:18 min:sec Valid Data From Scan: 1 to Scan: 608

Acqu Parameters		ITD Calibration		Instrument	
Acqu Mode: M.I.D		Slope: 6.301 dacs/amu		Filament #: 2	
Scan Range: 35-270 amu		Std Dev: 0.025 dacs/amu		Multiplier: 2300 Volts	
Scan Time: 2.000 secs		Defect: 100 mmu/100amu		Tmp Set Pt: 260 C	
Threshold: 1 counts		MID Tune Sens: 8000		Temperatures	
AGC on Bkgrd Mass 40 amu		(1) 41-75 u Tune: 71		Open Split:	257 256 C
Micro-Scans: 6		(2) 76-94 u Tune: 80		Xfer Line:	260 261 C
Fil/Mul Delay: 0 secs		(3) 95-130 u Tune: 89		Exit Nozzle:	255 254 C
Sched Time: 24 minutes		(4) 131-150 u Tune: 96		Manifold:	223 221 C
User Abort: yes					
(5) 151-170 @ 98	(8) 221-260 @ 107				
(6) 171-180 @ 100					
(7) 181-220 @ 102					

&lt;no entrys logged&gt;

Real Time Chromatogram of LP444 (5ml) C3376 From 0 min To 40 min  
Channel A: PID Channel B: HECD  
Range = 2 mV Offset = 4.872 mV Range = 65 mV Offset = -2.326 mV



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Sample Name LP444 (5ml) C3376

Date: 17 May 1988 15:57 Method: VOCAEXm Operator: NJM  
Interface: 706 Cycle#: 11 Channel#: A Vial#: -1

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NOTE: The Data Was Stored In File VFID 11:,702

\*\*\*\*\* EXTERNAL STANDARD REPORT \*\*\*\*\*  
Data From Sample LP444 (5ml) C3376 Collected on 17 May 1988 15:57  
Delay Time : 0.00 Run Time : 40.00  
Area Reject = 200 uV-sec Sampling Rate = 2.49 pts/sec  
Bunch Factor = 2 pts  
Noise Threshold = 2 uV Area Threshold = 50 uV-sec  
Sample Amount = 1 ug/l Injection Vol = 12  
Dilution Factor = 1 Multiplier Amount = 1.0000

Peak Num	Ret Time	Peak Name	Concentration as ug/l	Raw Area	Area Ratio	Cal Range	Peak Type	Ref Peak	X Delta Ret Time	Response Ratio
2	11.12	Acetone	6.61706	334	556	Under	1	3	.51531	84.0909
3	19.99	SM1 TOLUENE d6	103.83883	7476	12461	-	1	5	.05951	120.0000
5	27.45	SM2 1,9-DECADIENE	97.00260	11640	19401	Under	1	5	0	200.0000
6	28.09	sec-Butyl Benzene	1.31281	358	596	Under	1	5	-.2163	453.9604
7	31.49	UNKNOWN	1.40801	384	639	-	1	-		453.9604

Total Amount = 210.17932

Sample Name LP444 (5ml) C3376

Date: 17 May 1988 15:57 Method: VQCBEXm Operator: NJM  
Interface: 706 Cycle#: 11 Channel#: B Vial#: -1

NOTE: The Data Was Stored In File VECD 11:,702

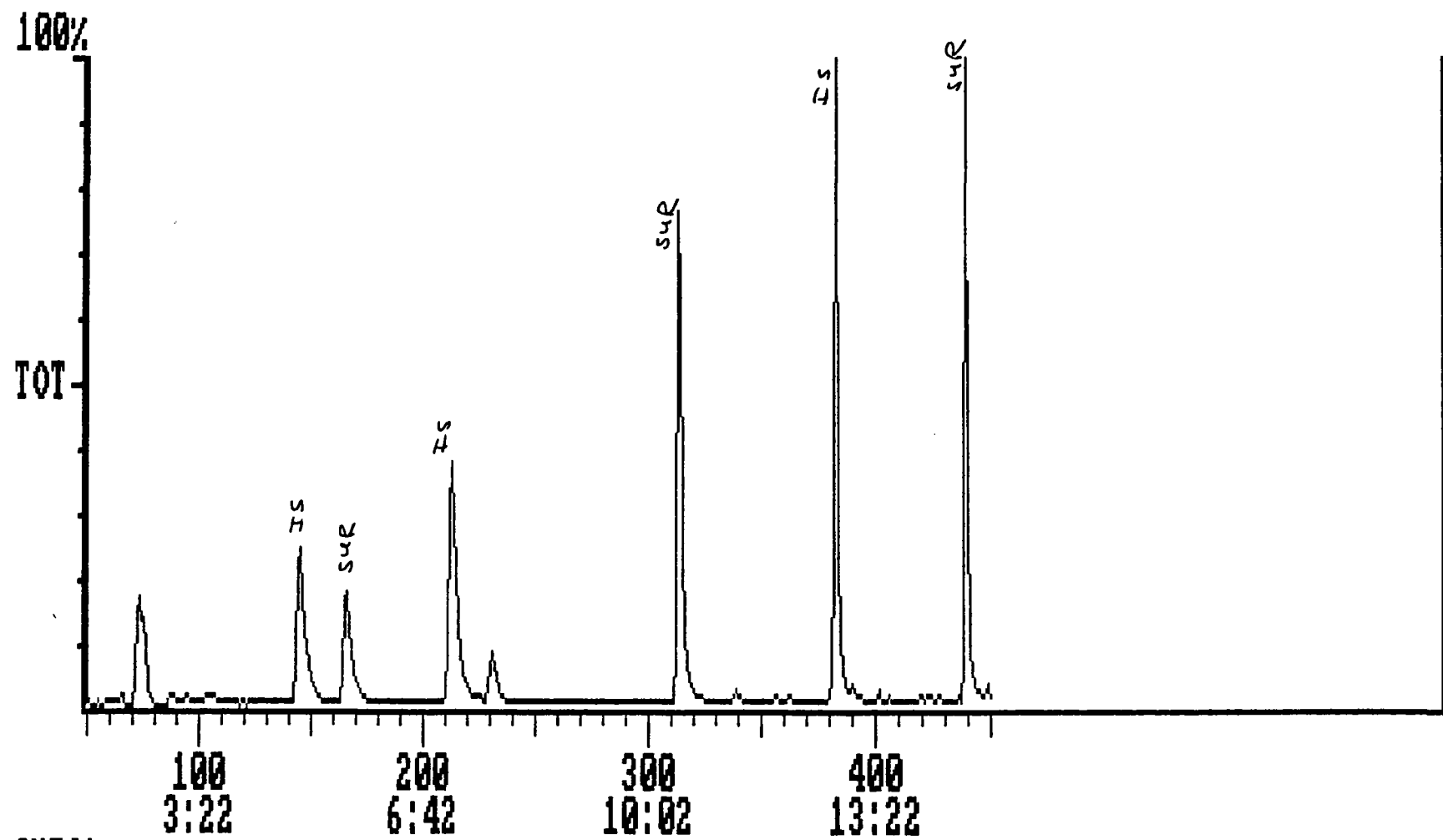
\*\*\*\*\* EXTERNAL STANDARD REPORT \*\*\*\*\*  
Data From Sample LP444 (5ml) C3376 Collected on 17 May 1988 15:57  
Delay Time : 0.00 Run Time : 40.00  
Area Reject = 4000 uV-sec Sampling Rate = 2.49 pts/sec  
Bunch Factor = 2 pts  
Noise Threshold = 2 uV Area Threshold = 200 uV-sec  
Sample Amount = 1 ug/l Injection Vol = 1  
Dilution Factor = 1 Multiplier Amount = 1.0000

Peak Num	Ret Time	Peak Name	Concentration as ug/l	Raw Area	Area Ratio	Cal Range	Peak Type	Ref Peak	X Delta Ret Time	Response Ratio
1	9.63	UNKNOWN	.98769	5413	5413	-	1	-		5480.0000
2	10.02	UNKNOWN	.93032	5098	5098	-	1	-		5480.0000
4	11.91	Methylene Chloride	.39793	22659	22659	Under	2	5	.02319	56941.7476
5	12.14	SM1 1,1,2-TRICHLOROTRIFLUOR	6.06304	238746	238746	-	2	9	.25625	39377.2618
6	14.13	Chloroform	.33032	18756	18756	Under	1	5	-.0689	56781.9118
7	15.03	1,2-Dichloroethane	.73130	36927	36927	Under	1	5	.13588	50495.2830
8	16.99	1,2-Dichloropropane	9.51592	385316	385316	-	1	9	.05171	40491.7069
9	17.96	SM2 1-BROMO-2-CHLOROETHAN	96.26041	411032	411032	-	1	9	0	4270.0000
10	24.64	SM3 1,4-DICHLOROBUTANE	98.26692	538503	538503	-	1	9	.02859	5480.0000

Total Amount = 211.56584

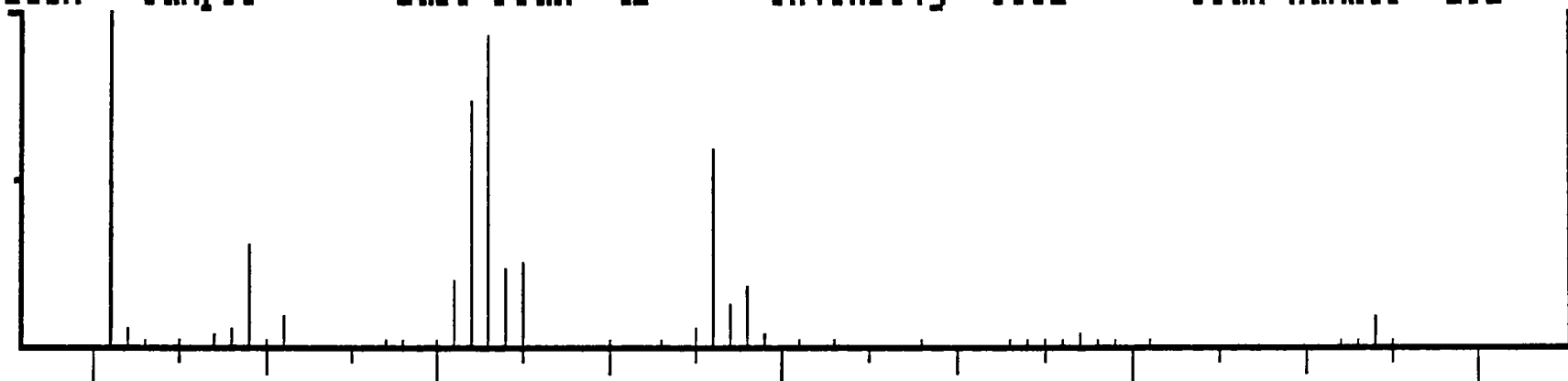
Chromatogram      \DATA\LP444  
Comment: EMB C3376 (5ml + SUR/IS)  
Scan Range: 50 - 450      Scan: 50

Acquired: Jun-07-1988      08:55:54  
Int = 2994      @ 1:42      RIC: 100% = 377258  
MID

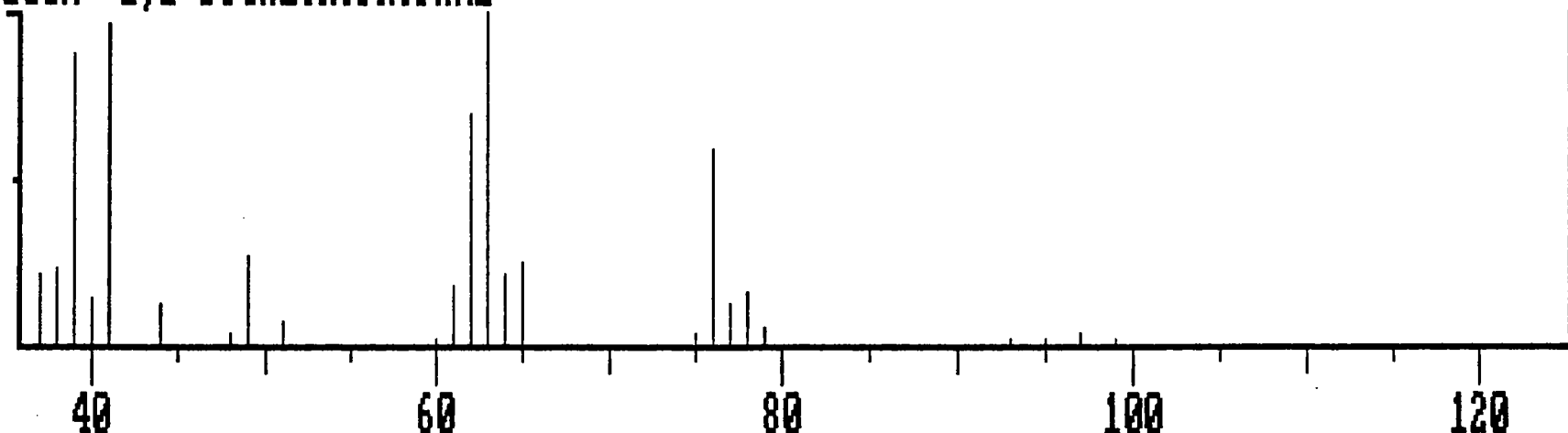


Library Search      \DATA\LP444  
Comment: EMB C3376 (5ml + SUR/IS)  
100% Sample      Base Peak 41

Acquired: Jun-07-1988 08:55:54 + 7:44  
Intensity 3551      Scan number 231  
MID



100% 1,2-DICHLOROPROPANE



Formula: C3.H6.CL2.      Rank 1      Index 21  
Molecular weight 112      Purity 75%      Fit 80%      Rfit 93%      Cas# 0-00-0  
VOCMLB (Purity, mass range 36 - 120, weight range 0 - 500)

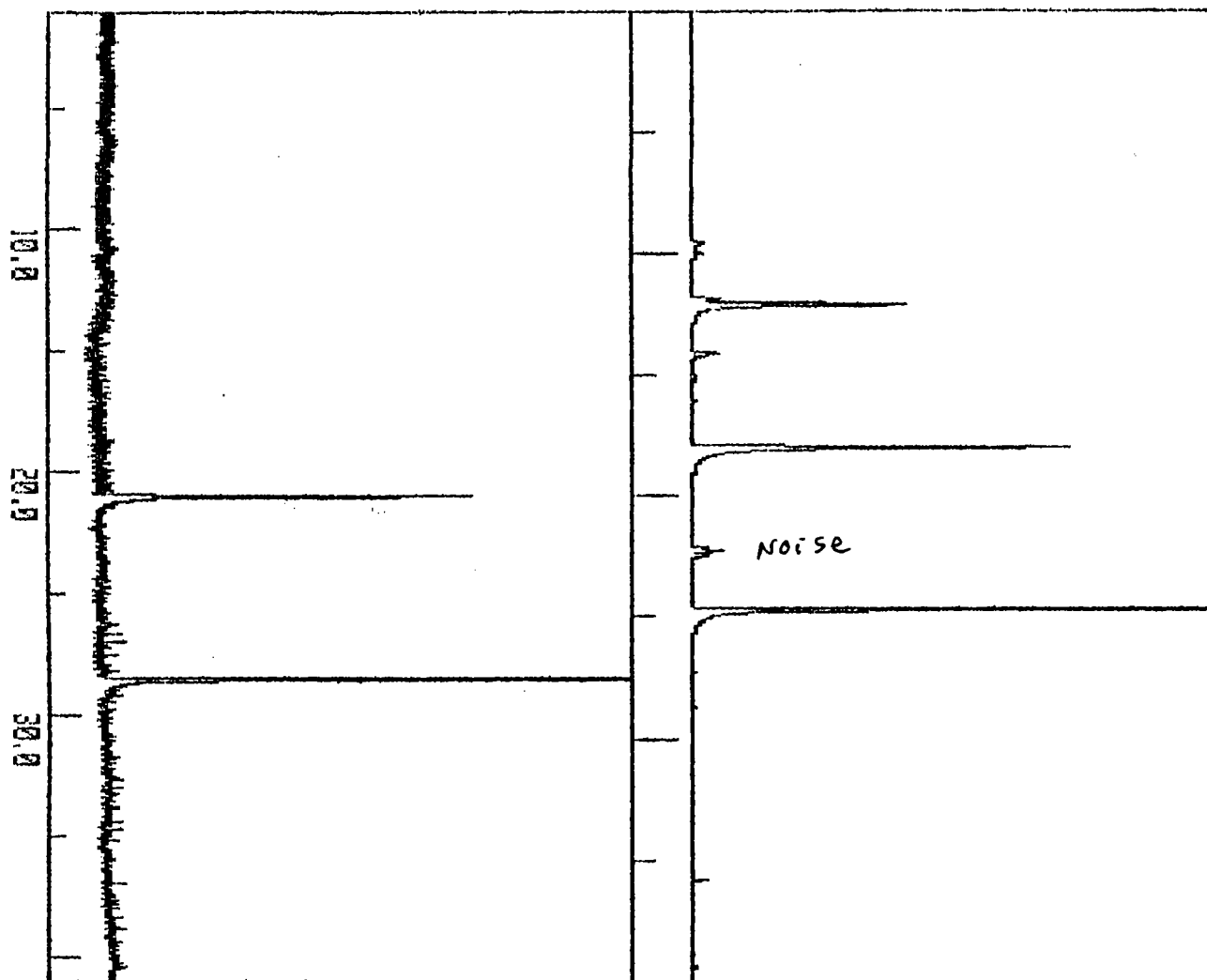
Real Time Chromatogram of LP445 (5ml) C3377 From 0 min To 40 min

Channel A: PID

Channel B: HECD

Range = 2 mV Offset = 4.875 mV

Range = 65 mV Offset = -2.325 mV



=====

Sample Name LP445 (5ml) C3377

Date: 17 May 1988

14:18

Method: VOCAEXm

Operator: NJM

Interface: 706

Cycle#: 9

Channel#: A

Vial#: -1

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NOTE: The Data Was Stored In File VPID 9:,702

\*\*\*\*\* EXTERNAL STANDARD REPORT \*\*\*\*\*

Data From Sample LP445 (5ml) C3377 Collected on 17 May 1988 14:18  
Delay Time : 0.00 Run Time : 40.00  
Area Reject = 200 uV-sec Sampling Rate = 2.49 pts/sec  
Bunch Factor = 2 pts  
Noise Threshold = 2 uV Area Threshold = 50 uV-sec  
Sample Amount = 1 ug/l Injection Vol = 12  
Dilution Factor = 1 Multiplier Amount = 1.0000

Peak	Ret	Peak	Concentration as	Raw	Area	Cal	Peak	Ref	% Delta	Response
------	-----	------	------------------	-----	------	-----	------	-----	---------	----------

Num	Time	Name	ug/l	Area	Ratio	Range	Type	Peak	Ret Time	Ratio
1	20.07	SM1 TOLUENE d6	101.37938	7299	12166	-	1	3	.13126	120.0000
2	25.33	UNKNOWN	9.04221	651	1085	-	1	-		120.0000
3	27.54	SM2 1,9-DECADIENE	107.94035	12953	21588	Over	1	3	0	200.0000
5	31.93	UNKNOWN	1.83245	220	366	-	1	-		200.0000

Total Amount = 220.19438

Sample Name LP445 (5ml) C3377

Date: 17 May 1988 14:18 Method: VOCBEXm Operator: NJM  
Interface: 706 Cycle#: 9 Channel#: B Vial#: -1

NOTE: The Data Was Stored In File VECD 9:,702

\*\*\*\*\* EXTERNAL STANDARD REPORT \*\*\*\*\*

Data From Sample LP445 (5ml) C3377 Collected on 17 May 1988 14:18  
Delay Time : 0.00 Run Time : 40.00  
Area Reject = 4000 uV-sec Sampling Rate = 2.49 pts/sec  
Bunch Factor = 2 pts  
Noise Threshold = 2 uV Area Threshold = 200 uV-sec  
Sample Amount = 1 ug/l Injection Vol = 1  
Dilution Factor = 1 Multiplier Amount = 1.0000

Peak	Ret	Peak	Concentration as	Raw	Area	Cal	Peak	Ref	% Delta	Response
Num	Time	Name	ug/l	Area	Ratio	Range	Type	Peak	Ret Time	Ratio
1	9.63	UNKNOWN	3.25007	17810	17810	-	2	-		5180.0000
2	10.01	UNKNOWN	2.16552	11867	11867	-	2	-		5180.0000
3	11.94	Methylene Chloride	.39520	22504	22504	Under	2	4	.07351	56941.7476
4	12.16	SM1 1,1,2-TRICLOROFLUOR	6.16267	240986	240986	-	2	8	.01803	39104.0869
5	14.16	Chloroform	.33558	19055	19055	Under	1	4	.04945	56781.9118
8	18.03	SM2 1-BROMO-2-CHLOROETHAN	89.67038	382893	382893	-	1	8	0	4270.0000
12	24.72	SM3 1,4-DICHLOROBUTANE	82.76542	453554	453554	-	1	8	-.0250	5180.0000
14	35.80	UNKNOWN	.82546	4524	4524	-	1	-		5180.0000

Total Amount = 180.15472

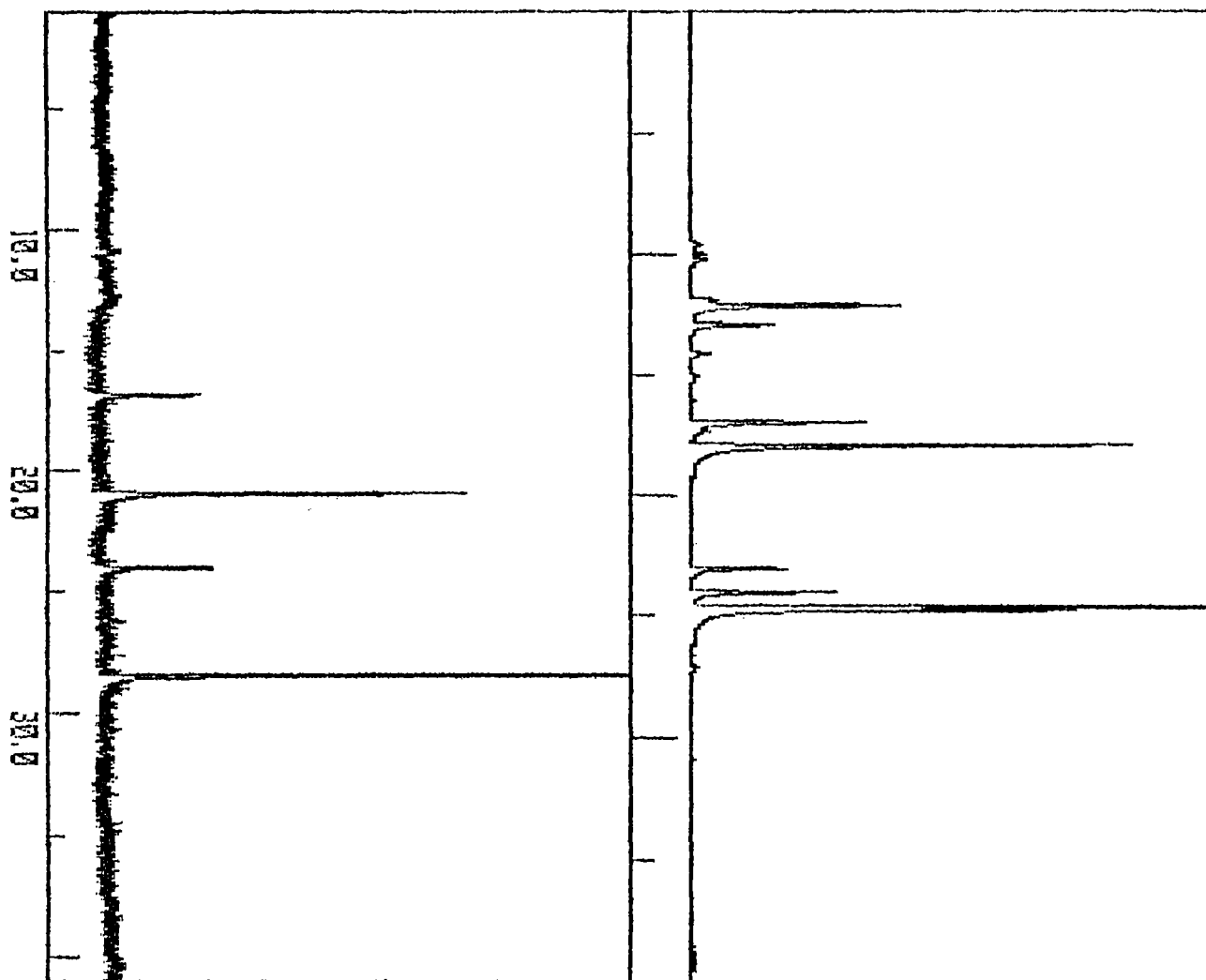
Real Time Chromatogram of SPIKE LP445 C3377 From 0 min To 40 min

Channel A: PID

Channel B: HECD

Range = 2 mV Offset = 4.874 mV

Range = 65 mV Offset = -2.335 mV



=====

Sample Name SPIKE LP445 C3377

Date: 17 May 1988 20:01 Method: VOCAEXm Operator: NJM

Interface: 706 Cycle#: 15 Channel#: A Vial#: -1

=====



NOTE: The Data Was Stored In File VFID 15:702

\*\*\*\*\* EXTERNAL STANDARD REPORT \*\*\*\*\*

Data From Sample SPIKE LP445 C3377 Collected on 17 May 1988 20:01

Delay Time : 0.00

Run Time : 40.00

Area Reject = 200 uV-sec Sampling Rate = 2.49 pts/sec

Bunch Factor = 2 pts

Noise Threshold = 2 uV

Area Threshold = 50 uV-sec

Sample Amount = 1 ug/l

Injection Vol = 12

Dilution Factor = 1

Multiplier Amount = 1.0000

Peak Num	Ret Time	Peak Name	Concentration as ug/l	Raw Area	Area Ratio	Cal Range	Peak Type	Ref Peak	X Delta Ret Time	Response Ratio
1	15.86	Benzene	3.18218	2626	4377	-	1	2	.08997	1375.5080
2	20.00	S#1 TOLUENE d6	79.95613	5757	9595	-	1	4	.04276	120.0000
3	23.07	Chlorobenzene	2.88582	1801	3001	-	1	4	.06607	1040.0026
4	27.46	S#2 1,9-DECADIENE	113.85143	13662	22770	Over	1	4	0	200.0000

Total Amount = 199.87555

Sample Name SPIKE LP445 C3377

Date: 17 May 1988

20:01

Method: VOCBEXm

Operator: NJM

Interface: 706

Cycle#: 15

Channel#: 8

Vial#: -1

NOTE: The Data Was Stored In File VECD 15:702

\*\*\*\*\* EXTERNAL STANDARD REPORT \*\*\*\*\*

Data From Sample SPIKE LP445 C3377 Collected on 17 May 1988 20:01

Delay Time : 0.00

Run Time : 40.00

Area Reject = 4000 uV-sec Sampling Rate = 2.49 pts/sec

Bunch Factor = 2 pts

Noise Threshold = 2 uV

Area Threshold = 200 uV-sec

Sample Amount = 1 ug/l

Injection Vol = 1

Dilution Factor = 1

Multiplier Amount = 1.0000

Peak Num	Ret Time	Peak Name	Concentration as ug/l	Raw Area	Area Ratio	Cal Range	Peak Type	Ref Peak	X Delta Ret Time	Response Ratio
1	9.62	UNKNOWN	3.32517	18222	18222	-	2	-		5480.0000
2	10.01	UNKNOWN	1.74607	9568	9568	-	2	-		5480.0000
3	10.24	Vinyl Chloride	.90761	18957	18957	Under	2	5	.18203	20887.2222
4	11.92	Methylene Chloride	.41152	23433	23433	Under	2	5	.05438	56941.7476
5	12.14	S#1 1,1,2-TRICHLOROTRIFLUOR	5.90831	235267	235267	-	2	12	.29269	39019.7749
6	12.95	1,1-Dichloroethane	2.17455	67064	67064	-	1	5	-.0364	30840.4117
7	14.13	Chloroform	.36961	20987	20987	Under	1	5	-.0978	56701.9118
10	17.00	1,2-Dichloropropane	3.84198	148088	148088	-	3	12	.07683	38544.6741
11	17.37	Trichloroethylene	.40228	17445	17445	Under	4	12	.26400	43364.6870
12	17.96	S#2 1-BROMO-2-CHLOROETHAN	101.46122	433239	433239	-	1	12	0	4270.0000
14	23.08	Chlorobenzene	4.14036	78358	78358	-	1	16	.01653	18925.3849
15	24.05	Bromoform	6.51328	116051	116051	-	2	16	-.0036	17817.6514
16	24.63	S#3 1,4-DICHLOROBUTANE	84.57118	463450	463450	-	2	12	.02055	5480.0000
17	24.77	UNKNOWN	64.21664	351907	351907	-	2	-		5480.0000
18	27.09	UNKNOWN	1.39908	7667	7667	-	1	-		5480.0000

Total Amount =

276.31759

Real Time Chromatogram of DMS LP445 C3377

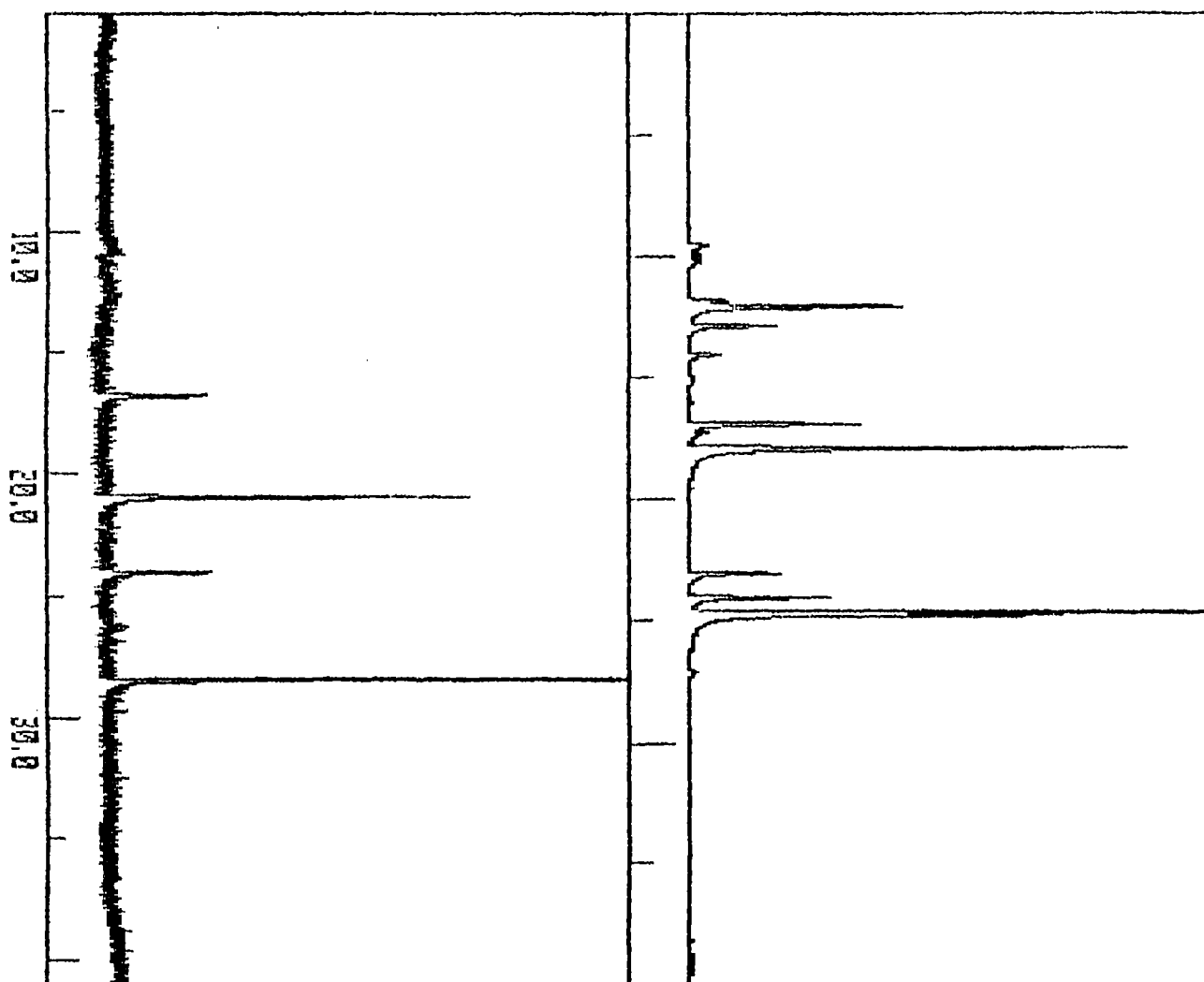
From 0 min To 40 min

Channel A: PID

Channel B: HECD

Range = 2 mV Offset = 4.874 mV

Range = 65 mV Offset = -2.338 mV



=====

Sample Name DMS LP445 C3377

Date: 17 May 1988

20:59

Method: VOCAEXm

Operator: NJM

Interface: 706

Cycle#: 16

Channel#: A

Vial#: -1

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## \*\*\*\*\* EXTERNAL STANDARD REPORT \*\*\*\*\*

Data From Sample DMS LP445 C3377 Collected on 17 May 1988 20:59  
 Delay Time : 0.00 Run Time : 40.00  
 Area Reject = 200 uV-sec Sampling Rate = 2.49 pts/sec  
 Bunch Factor = 2 pts  
 Noise Threshold = 2 uV Area Threshold = 50 uV-sec  
 Sample Amount = 1 ug/l Injection Vol = 12  
 Dilution Factor = 1 Multiplier Amount = 1.0000

Peak Num	Ret Time	Peak Name	Concentration as ug/l	Raw Area	Area Ratio	Cal Range	Peak Type	Ref Peak	X Delta Ret Time	Response Ratio
1	15.84	Benzene	2.63444	2196	3660	-	1	2	.01494	1389.1132
2	19.99	S81 TOLUENE d6	86.99392	6264	10439	-	1	6	.01881	120.0000
3	23.06	Chlorobenzene	3.30300	2115	3526	-	1	6	.04403	1067.3759
4	25.21	UNKNOWN	.58215	485	809	-	2	1		1389.1132
5	25.41	UNKNOWN	.44627	372	620	-	2	1		1389.1132
6	27.45	S82 1,9-DECADIENE	107.05763	12847	21412	Over	1	6	0	200.0000
7	28.70	UNKNOWN	.80837	674	1123	-	1	1		1389.1132

Total Amount = 201.82577

## \*\*\*\*\* EXTERNAL STANDARD REPORT \*\*\*\*\*

Data From Sample DMS LP445 C3377 Collected on 17 May 1988 20:59  
 Delay Time : 0.00 Run Time : 40.00  
 Area Reject = 4000 uV-sec Sampling Rate = 2.49 pts/sec  
 Bunch Factor = 2 pts  
 Noise Threshold = 2 uV Area Threshold = 200 uV-sec  
 Sample Amount = 1 ug/l Injection Vol = 1  
 Dilution Factor = 1 Multiplier Amount = 1.0000

Peak Num	Ret Time	Peak Name	Concentration as ug/l	Raw Area	Area Ratio	Cal Range	Peak Type	Ref Peak	X Delta Ret Time	Response Ratio
1	9.60	UNKNOWN	.61686	29412	29412	-	2	-		47679.9922
2	9.98	UNKNOWN	.18218	8686	8686	-	2	-		47679.9922
3	10.22	Vinyl Chloride	.57004	11907	11907	Under	2	5	.14587	20887.2222
4	11.90	Methylene Chloride	.59379	33811	33811	Under	2	5	.05973	56941.7476
5	12.12	S81 1,1,2-TRICHLOROTRIFLUOR	6.10342	239654	239654	-	2	12	.13236	39265.4881
6	12.92	1,1-Dichloroethane	2.37445	75075	75075	-	2	5	-.0108	31617.7121
7	14.10	Chloroform	.50808	28850	28850	Under	1	5	-.0588	56791.9118
10	17.00	1,2-Dichloropropane	3.70672	142433	142433	-	3	12	.11373	38425.5176
11	17.36	Trichloroethylene	.43623	18917	18917	Under	4	12	.24516	43364.6870
12	17.96	S82 1-BROMO-2-CHLOROETHANE	94.61800	404019	404019	-	1	12	0	4270.0000
15	23.08	Chlorobenzene	3.72894	69462	69462	-	1	18	.01411	18627.8733
17	24.05	Bromoform	6.28951	111375	111375	-	2	18	-.0043	17708.0680
18	24.63	S83 1,4-DICHLOROBUTANE	83.30021	456485	456485	-	2	12	.04814	5480.0000
19	24.76	1,1,2,2-Tetrachloroethane	7.07709	337436	337436	-	2	18	-.0202	47679.9922
20	27.09	UNKNOWN	.09931	4735	4735	-	1	-		47679.9922

Total Amount = 210.20482

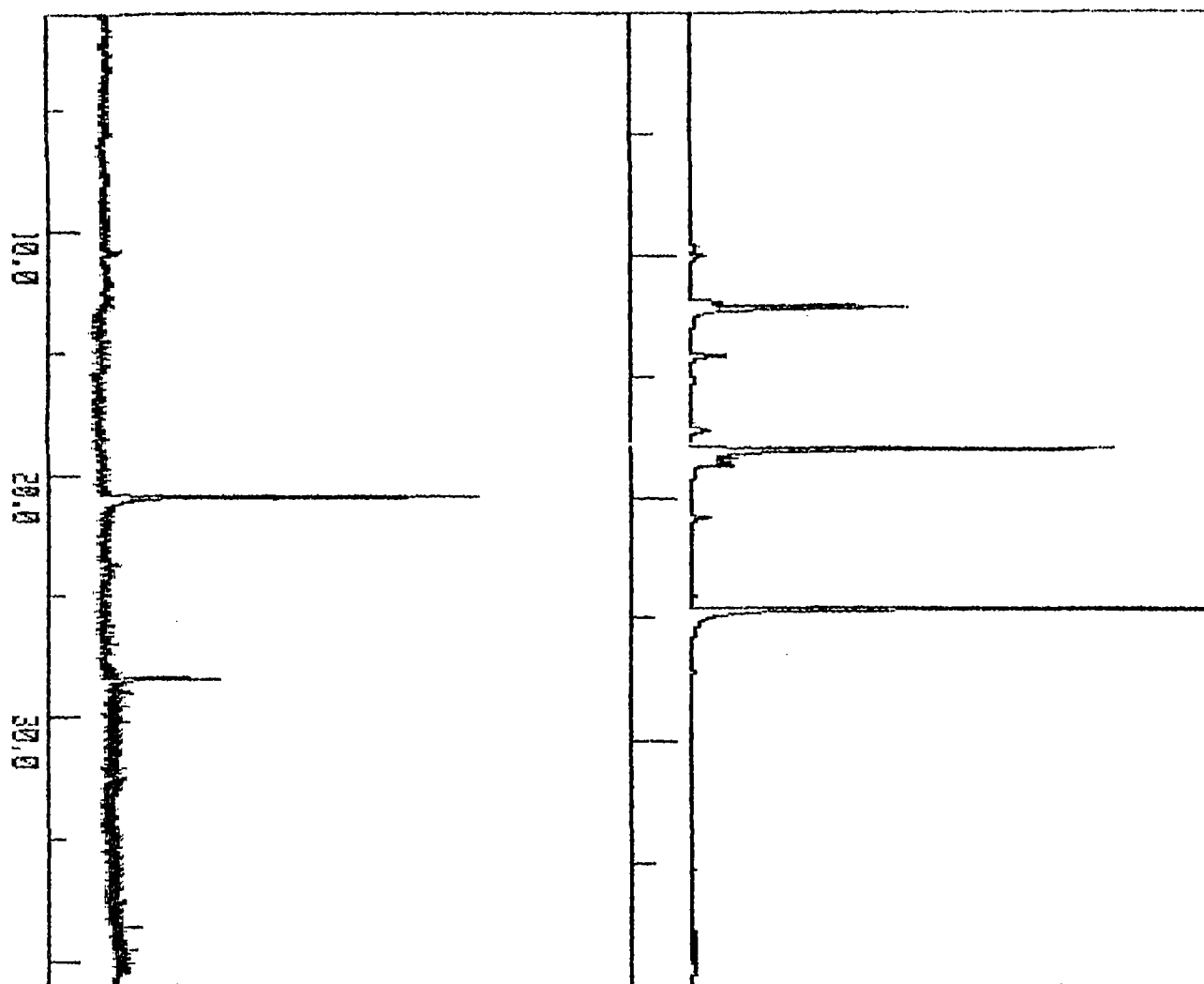
Real Time Chromatogram of LP446 (5ml) C3378 From 0 min To 40 min

Channel A: PID

Channel B: HECD

Range = 2 mV Offset = 4.851 mV

Range = 65 mV Offset = -2.339 mV



=====

Sample Name LP446 (5ml) C3378

Date: 17 May 1988

17:07

Method: VOCAEXm

Operator: NJM

Interface: 706

Cycle#: 12

Channel#: A

Vial#: -1

=====

NOTE: The Data Was Stored In File VECD 12:702

\*\*\*\*\* EXTERNAL STANDARD REPORT \*\*\*\*\*  
Data From Sample LP446 (5ml) C3378 Collected on 17 May 1988 17:07  
Delay Time : 0.00 Run Time : 40.00  
Area Reject = 200 uV-sec Sampling Rate = 2.49 pts/sec  
Bunch Factor = 2 pts  
Noise Threshold = 2 uV Area Threshold = 50 uV-sec  
Sample Amount = 1 ug/l Injection Vol = 12  
Dilution Factor = 1 Multiplier Amount = 1.0000

Peak Num	Ret Time	Peak Name	Concentration as ug/l	Raw Area	Area Ratio	Cal Range	Peak Type	Ref Peak	% Delta Ret Time	Response Ratio
1	9.84	UNKNOWN	2.09040	251	418	-	1	-		200.0000
3	20.00	SM1 TOLUENE d6	101.51338	7309	12182	-	1	6	.28635	120.0000
4	24.79	UNKNOWN	4.18750	301	503	-	1	-		120.0000
5	24.98	UNKNOWN	4.24892	306	510	-	1	-		120.0000
6	27.46	SM2 1,9-DECAOLENE	20.69462	2483	4139	Under	1	6	.25088	200.0000

Total Amount = 130.64442

Sample Name LP446 (5ml) C3378

Date: 17 May 1988 17:07 Method: VOCBEXm Operator: NJM  
Interface: 706 Cycle#: 12 Channel#: B Vial#: -1

NOTE: The Data Was Stored In File VECD 12:702

\*\*\*\*\* EXTERNAL STANDARD REPORT \*\*\*\*\*  
Data From Sample LP446 (5ml) C3378 Collected on 17 May 1988 17:07  
Delay Time : 0.00 Run Time : 40.00  
Area Reject = 4000 uV-sec Sampling Rate = 2.49 pts/sec  
Bunch Factor = 2 pts  
Noise Threshold = 2 uV Area Threshold = 200 uV-sec

Sample Amount = 1 ug/l Injection Vol = 1  
Dilution Factor = 1 Multiplier Amount = 1.0000

Peak Num	Ret Time	Peak Name	Concentration as ug/l	Raw Area	Area Ratio	Cal Range	Peak Type	Ref Peak	% Delta Ret Time	Response Ratio
1	9.63	UNKNOWN	1.82668	10010	10010	-	2	-		5480.0000
2	10.02	UNKNOWN	2.50361	13720	13720	-	2	-		5480.0000
4	11.92	Methylene Chloride	.49241	28039	28039	Under	2	5	.02771	56941.7476
5	12.14	SM1 1,1,2-TRICLOROETHYLENE	6.30022	244078	244078	-	2	10	.26109	38741.1566
6	14.14	Chloroform	.65225	37036	37036	Under	1	5	.01291	56781.9118
7	15.10	1,2-Dichloroethane	.08002	4041	4041	Under	2	5	.59172	50495.2830
8	15.28	1,1,1-Trichloroethane	.23835	5329	5329	Under	2	5	-.1562	22359.2391
9	17.36	Trichloroethylene- $\alpha$ -B $\alpha$ Cl $\alpha$ CH $\alpha$	.49762	21579	21579	Under	1	10	.18735	43364.6870
10	17.96	SM2 1-BROMO-2-CHLOROETHANE	83.38421	356051	356051	-	2	10	0	4270.0000
11	18.34	2-Chloroethylvinylether	1.78785	6245	6245	Under	2	10	.33488	3492.8205
13	18.61	c-1,3-Dichloropropene	.53998	14460	14460	Under	1	10	-.2808	26778.4141
14	20.85	Chlorodibromomethane	.71813	15870	15870	Under	1	10	.19693	22099.5205
17	24.64	SM3 1,4-DICHLOROBUTANE	103.29038	566031	566031	-	1	10	.05319	5480.0000

Total Amount = 197.98142

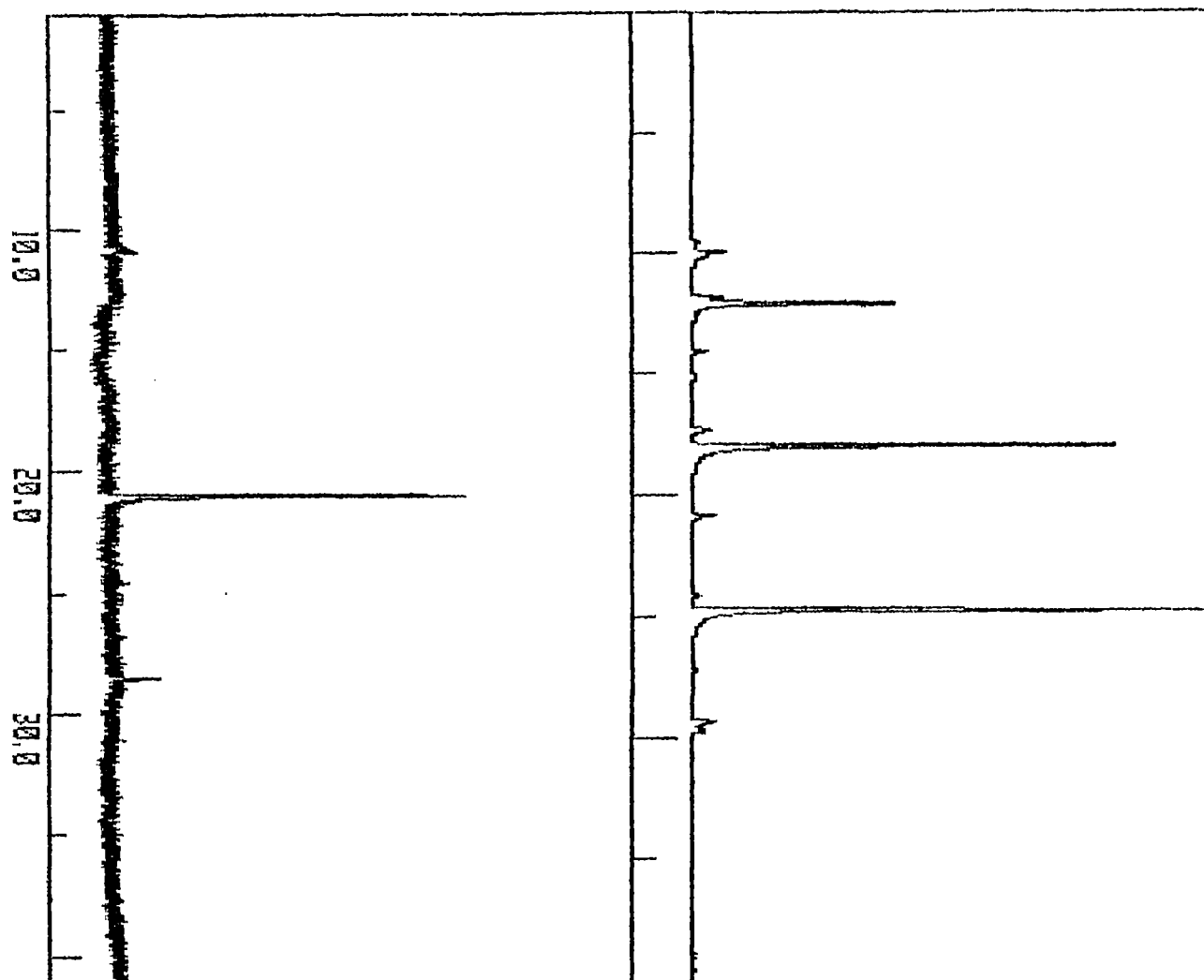
Real Time Chromatogram of LP446 (5ml) C3378 From 0 min To 40 min

Channel A: PID

Channel B: HECD

Range = 2 mV Offset = 4.871 mV

Range = 65 mV Offset = -2.352 mV



Sample Name LP446 (5ml) C3378

Date: 18 May 1988 04:41 Method: VOCAEXm

Operator: NJM

Interface: 706

Cycle#: 24

Channel#: A

Vial#: -1

NOTE: The Data Was Stored In File VPID 24:,702

\*\*\*\*\* EXTERNAL STANDARD REPORT \*\*\*\*\*

Data From Sample LP446 (5ml) C3378 Collected on 18 May 1988 04:41

Delay Time : 0.00

Run Time : 40.00

Area Reject = 200 uV-sec Sampling Rate = 2.49 pts/sec

Bunch Factor = 2 pts

Noise Threshold = 2 uV

Area Threshold = 50 uV-sec

Sample Amount = 1 ug/l

Injection Vol = 12

Dilution Factor = 1

Multiplier Amount = 1.0000

Peak Num	Ret Time	Peak Name	Concentration as ug/l	Raw Area	Area Ratio	Cal Range	Peak Type	Ref Peak	% Delta Ret Time	Response Ratio
1	16.53	UNKNOWN	1.23022	301	503	-	1	-		408.4633
2	20.03	SM1 TOLUENE d6	75.67092	5448	9081	-	1	0	.42876	120.0000
3	27.51	tert-Butylbenzene	3.10751	762	1269	-	1	0	-.2917	408.4633

Total Amount = 78.77845

Sample Name LP446 (5ml) C3378

Date: 18 May 1988

04:41

Method: VOCBEXm

Operator: NJM

Interface: 706

Cycle#: 24

Channel#: 8

Vial#: -1

NOTE: The Data Was Stored In File VECD 24:,702

\*\*\*\*\* EXTERNAL STANDARD REPORT \*\*\*\*\*

Data From Sample LP446 (5ml) C3378 Collected on 18 May 1988 04:41

Delay Time : 0.00

Run Time : 40.00

Area Reject = 4000 uV-sec Sampling Rate = 2.49 pts/sec

Bunch Factor = 2 pts

Noise Threshold = 2 uV

Area Threshold = 200 uV-sec

Sample Amount = 1 ug/l

Injection Vol = 1

Dilution Factor = 1

Multiplier Amount = 1.0000

Peak Num	Ret Time	Peak Name	Concentration as ug/l	Raw Area	Area Ratio	Cal Range	Peak Type	Ref Peak	% Delta Ret Time	Response Ratio
1	9.59	UNKNOWN	1.60888	8817	8817	-	1	-		5480.0000
2	9.97	UNKNOWN	2.60251	14262	14262	-	1	-		5480.0000
3	11.88	Methylene Chloride	.46192	26302	26302	Under	2	4	.02982	56941.7476
4	12.11	SM1 1,1,2-TRICHLOROTRIFLUOR	5.14278	218058	218058	-	2	9	-.0858	42400.8129
5	14.11	Chloroform	.26604	15106	15106	Under	1	4	.00654	56781.9118
8	17.37	Trichloroethylene $\text{C}_2\text{H}_3\text{Cl}_3$	.52217	22644	22644	Under	1	9	.19720	43364.6870
9	17.98	SM2 1-BROMO-2-CHLOROETHAN	95.73955	408808	408808	-	1	9	0	4270.0000
10	20.86	Chlorodibromomethane	.81705	18056	18056	Under	1	9	.17424	22099.5205
11	24.10	Bromoform	.37127	4959	4959	Under	1	12	.07849	13355.9211
12	24.67	SM3 1,4-DICHLOROBUTANE	94.13538	515862	515862	-	1	9	.07867	5480.0000
14	29.26	UNKNOWN	.75397	4132	4132	-	1	-		5480.0000

Total Amount = 198.21013

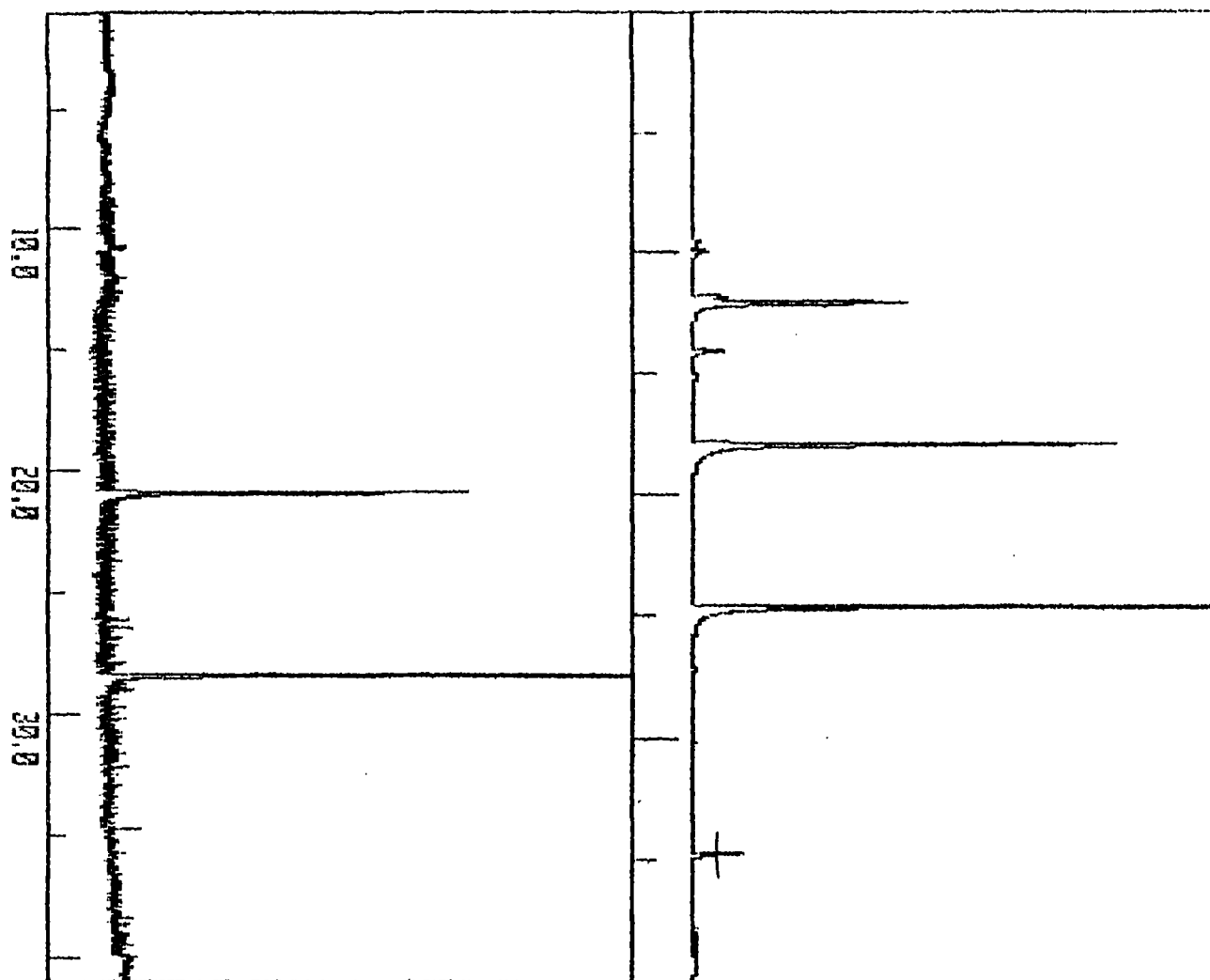
Real Time Chromatogram of LP447 (5ml) C3379 From 0 min To 40 min

Channel A: PID

Channel B: HECD

Range = 2 mV Offset = 4.858 mV

Range = 65 mV Offset = -2.34 mV



=====

Sample Name LP447 (5ml) C3379

Date: 17 May 1988

18:04

Method: VOCAEXm

Operator: NJM

Interface: 706

Cycle#: 13

Channel#: A

Vial#: -1

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\*\*\*\*\* EXTERNAL STANDARD REPORT \*\*\*\*\*  
 Data From Sample LP447 (5ml) C3379 Collected on 17 May 1988 18:04  
 Delay Time : 0.00 Run Time : 40.00  
 Area Reject = 200 uV-sec Sampling Rate = 2.49 pts/sec  
 Bunch Factor = 2 pts  
 Noise Threshold = 2 uV Area Threshold = 50 uV-sec  
 Sample Amount = 1 ug/l Injection Vol = 12  
 Dilution Factor = 1 Multiplier Amount = 1.0000

Peak Num	Ret Time	Peak Name	Concentration as ug/l	Raw Area	Area Ratio	Cal Range	Peak Type	Ref Peak	% Delta Ret Time	Response Ratio
1	20.00	S#1 TOLUENE d6	92.32879	6648	11079	-	1	2	.05385	120.0000
2	27.46	S#2 1,9-DECADIENE	90.05785	11767	19612	Under	1	2	1.3802	200.0000
Total Amount =			190.38664							

Sample Name LP447 (5ml) C3379

Date: 17 May 1988 18:04 Method: VOCBEXm Operator: NJM  
 Interface: 706 Cycle#: 13 Channel#: B Vial#: -1

NOTE: The Data Was Stored In File VEGD 13:702

\*\*\*\*\* EXTERNAL STANDARD REPORT \*\*\*\*\*  
 Data From Sample LP447 (5ml) C3379 Collected on 17 May 1988 18:04  
 Delay Time : 0.00 Run Time : 40.00  
 Area Reject = 4000 uV-sec Sampling Rate = 2.49 pts/sec  
 Bunch Factor = 2 pts  
 Noise Threshold = 2 uV Area Threshold = 200 uV-sec  
 Sample Amount = 1 ug/l Injection Vol = 1  
 Dilution Factor = 1 Multiplier Amount = 1.0000

Peak Num	Ret Time	Peak Name	Concentration as ug/l	Raw Area	Area Ratio	Cal Range	Peak Type	Ref Peak	% Delta Ret Time	Response Ratio
1	9.63	UNKNOWN	2.32019	12715	12715	-	2	-		5480.0000
2	10.02	UNKNOWN	3.36114	18419	18419	-	2	-		5480.0000
3	11.91	Methylene Chloride	.56462	32151	32151	Under	2	4	.04647	56941.7476
4	12.14	S#1 1,1,2-TRICLOROTRIFLUOR	6.39047	246107	246107	-	2	7	.24216	38511.5183
5	14.13	Chloroform	.56143	31879	31879	Under	1	4	-.0257	56781.9118
7	17.96	S#2 1-BROMO-2-CHLOROETHAN	95.51911	407867	407867	-	1	7	0	4270.0000
8	24.63	S#3 1,4-DICHLOROBUTANE	96.14762	526889	526889	-	1	7	.03983	5480.0000
10	34.72	UNKNOWN	2.83469	15534	15534	-	1	-		5480.0000
Total Amount =			202.01793							

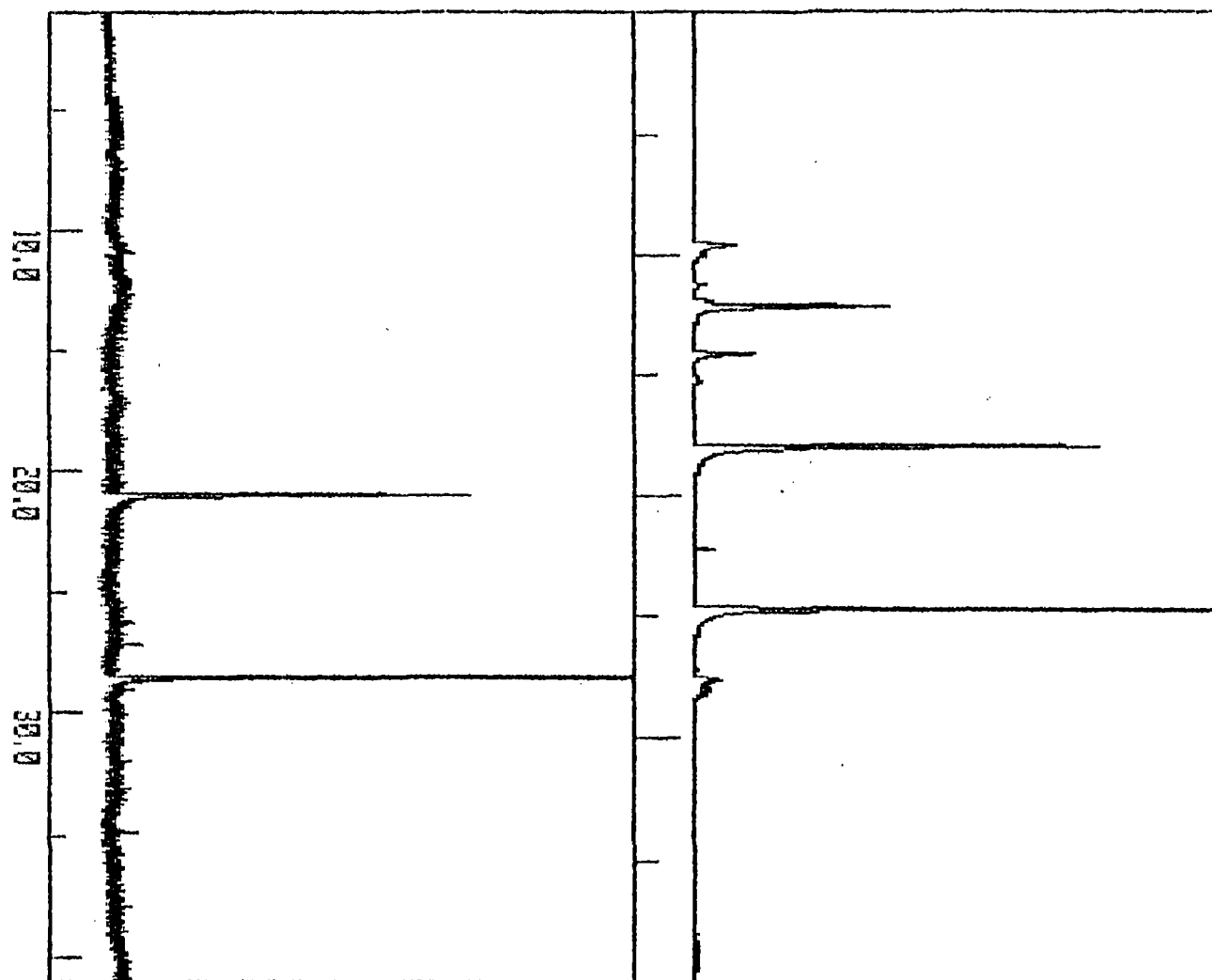
Real Time Chromatogram of LP448 (5ml) C3380 From 0 min To 40 min

Channel A: PID

Channel B: HECD

Range = 2 mV Offset = 4.845 mV

Range = 65 mV Offset = -2.34 mV



Sample Name LP448 (5ml) C3380

Date: 17 May 1988. 19:03 Method: VOCAEXm

Operator: NJM

Interface: 706

Cycle#: 14

Channel#: A

Vial#: -1

Delay Time : 0.00 Run Time : 40.00  
 Area Reject = 200 uV-sec Sampling Rate = 2.48 pts/sec  
 Bunch Factor = 2 pts  
 Noise Threshold = 2 uV Area Threshold = 50 uV-sec  
 Sample Amount = 1 ug/l Injection Vol = 12  
 Dilution Factor = 1 Multiplier Amount = 1.0000

Peak Num	Ret Time	Peak Name	Concentration as ug/l	Raw Area	Area Ratio	Cal Range	Peak Type	Ref Peak	% Delta Ret Time	Response Ratio
1	12.74	t-1,2-Dichloroethylene	.61237	276	460	Under	1	3	-.4139	751.1111
3	20.03	S#1 TOLUENE d6	100.08125	7206	12010	-	1	5	-.0153	120.0000
4	26.14	UNKNOWN	8.03412	578	964	-	1	-		120.0000
5	27.53	S#2 1,9-DECADIENE	98.71110	11845	19742	Under	1	5	0	200.0000

Total Amount = 207.43913

Sample Name LP448 (5ml) C3380

Date: 17 May 1988 19:03 Method: VOCBEXm Operator: NJM  
 Interface: 706 Cycle#: 14 Channel#: B Vial#: -1

NOTE: The Data Was Stored In File VECD 14:702

\*\*\*\*\* EXTERNAL STANDARD REPORT \*\*\*\*\*

Data From Sample LP448 (5ml) C3380 Collected on 17 May 1988 19:03

Delay Time : 0.00 Run Time : 40.00  
 Area Reject = 4000 uV-sec Sampling Rate = 2.49 pts/sec  
 Bunch Factor = 2 pts  
 Noise Threshold = 2 uV Area Threshold = 200 uV-sec  
 Sample Amount = 1 ug/l Injection Vol = 1  
 Dilution Factor = 1 Multiplier Amount = 1.0000

Peak Num	Ret Time	Peak Name	Concentration as ug/l	Raw Area	Area Ratio	Cal Range	Peak Type	Ref Peak	% Delta Ret Time	Response Ratio
1	9.61	UNKNOWN	12.02425	65893	65893	-	2	-		5480.0000
2	10.01	UNKNOWN	2.35301	12895	12895	-	2	-		5480.0000
3	11.25	Trichlorofluoromethane	.41614	12618	12618	Under	1	5	.00413	30322.5000
4	11.93	Methylene Chloride	.28777	16386	16386	Under	2	5	.08475	56941.7476
5	12.15	S#1 1,1,2-TRICHLOROTRIFLUOR	5.56614	227575	227575	-	2	9	.13150	40885.6587
6	14.13	Chloroform	1.09372	62104	62104	Under	1	5	-.0622	56781.9118
8	15.29	1,1,1-Trichloroethane	.38287	8561	8561	Under	2	5	-.1247	22359.2391
9	17.99	S#2 1-BROMO-2-CHLOROETHAN	92.19310	393665	393665	-	1	9	0	4270.0000
11	24.69	S#3 1,4-DICHLOROBUTANE	98.68007	540767	540767	-	1	9	.09040	5480.0000
13	27.56	UNKNOWN	1.97518	10824	10824	-	2	-		5480.0000
14	27.68	UNKNOWN	2.57778	14126	14126	-	2	-		5480.0000

Total Amount = 203.17278

EIS ENVIRONMENTAL ENGINEERS, INC.  
ANALYTICAL REPORT SHEET  
GROUNDWATER MONITORING ANALYSIS

EMB Sample C3373- SoilEIS # LP441TASK 5Turn Around Time 30 days

Date Analyzed: 5-17-88

## SURROGATE RESPONSES

<u>Surrogate No.</u>	<u>Solution No.</u>	<u>Compounds in Solution</u>	<u>% Recovery</u>	<u>QC Limits</u>
4	.	1-bromo-2-chloroethane	103	70 - 130
	.	1,4-dichlorobutane	103	70 - 130
	.	Toluene, d6	85	70 - 130
	.	1,9-decadiene	101	70 - 130

## SAMPLE RESULTS

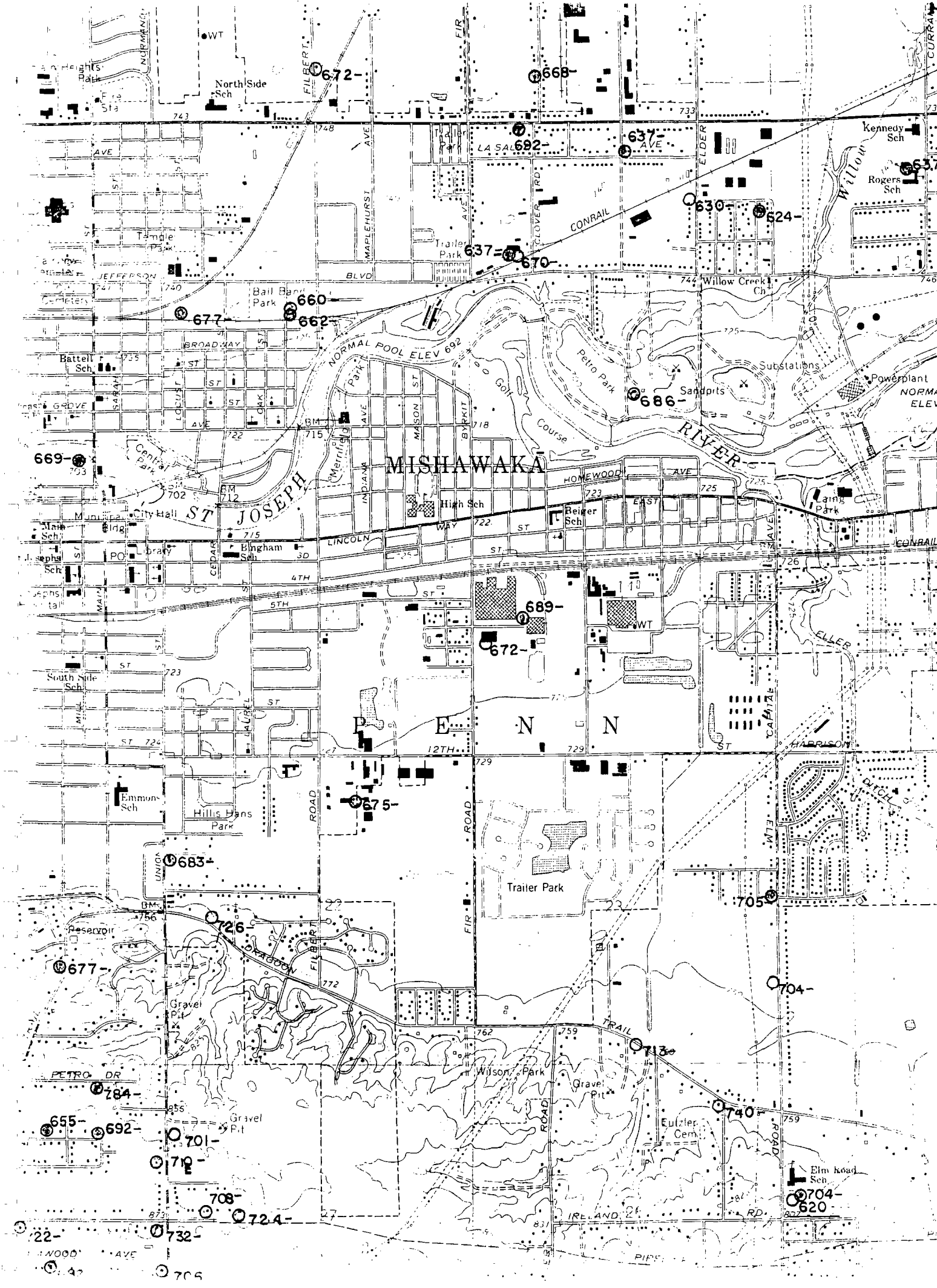
<u>Parameter</u>	<u>Result</u> <u>(mg/kg)</u>	<u>Replicate</u> <u>(mg/kg)</u>	<u>Precision</u> <u>(% RSD)</u>
Acetone	2.8		
Acrolein	<10		
Acrylonitrile	<10		
Benzene	<0.1		
Bromoform	<0.1		
Bromodichloromethane	<0.1		
Bromomethane	<0.1		
Carbon Disulfide	<10		
Carbon Tetrachloride	<0.1		
Chlorobenzene	<0.1		
Chlorodibromomethane	<0.1		
Chloroethane	<0.1		
2-Chloroethylvinylether	<0.5		
Chloroform	**		
Chloromethane	<0.1		
1,2-Dichlorobenzene	<0.1		
1,3-Dichlorobenzene	<0.1		
1,4-Dichlorobenzene	<0.1		
Dichlorodifluoromethane	<0.1		
1,1-Dichloroethane	<0.1		
1,2-Dichloroethane	<0.1		
1,1-Dichloroethene	<0.1		
t-1,2-Dichloroethene	<0.1		

\* As received basis - see Method Blank

\*\* Present but below PQL

**APPENDIX D**

**CHEMICAL ANALYSIS DATA**



**APPENDIX E**

**SITE GEOLOGIC ASSESSMENT**

APPENDIX E  
SITE GEOLOGIC ASSESSMENT



## DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

INDIANAPOLIS

OFFICE MEMORANDUM

DATE: March 9, 1989

TO: Tim Heffernan *YCH*  
Site Investigation SectionTHRU: Karyl Schmidt *KS 3-9-89*  
Harry Atkinson *HA 3/16*FROM: Billy Giles *BEG*  
Geology Section *3/9/89*SUBJECT: Old Mishawaka Dump SI Work Plan Geologic Assessment  
St. Joseph CountyINTRODUCTION

The Old Mishawaka Dump site is located at 1131 Fifth Street, Mishawaka, St. Joseph County, Indiana. The site is in Section 15, T. 37 N., R. 3 E. The site is now used as a municipal waste separation center for a spring cleanup program. During excavation of a pit to burn brush, numerous drums were exposed. The drums are below the water table. Two municipal wells are located approximately 1,500 feet from the site. These wells were found to contain low levels of volatile organic compounds in 1986.

SOILS

Most of the site consists of made land; cinders and slag have been used to fill a wetland area, smoothed over, and covered with soil material.

The northern portion of the site consists of a natural soil of the Maumee Series. The Maumee is a deep, very poorly drained, nearly level and depressional soil on outwash plains. These soils are mainly on low depressional flats and along stream channels. They formed in sandy glacial outwash or stream alluvium. Maumee soils have rapid permeability and a low available water capacity. The organic matter content is high in the surface layer. Runoff is very slow or ponded. This soil has a seasonal high water table within one foot of the surface.

GEOLOGY

The bedrock beneath the site is the Devonian Ellsworth Formation. The Ellsworth is composed of gray, green and black shales. The site is located northeast of the crest of the Kankakee Arch; the bedrock dips to the northeast toward the center of the Michigan Basin.

Approximately 150 feet of unconsolidated material overlies the bedrock. Most of the unconsolidated material is glacial outwash composed of sand and gravel. Interspersed within these deposits are thin clay/glacial till units of limited areal extent. In several places in the South Bend-Mishawaka area thick clay deposits are present below the surficial sand and gravel. These till units extend to near the bedrock surface.

To the east of the site, the surficial sand and gravel is found above a moderately thick (20 - 100 feet) clay/till zone which is underlain by zone of sand and gravel. The lower sand and gravel unit ranges in thickness from 20 to 50 feet.

Tim Heffernan  
March 9, 1989  
Page Two

#### HYDROGEOLOGY

The Devonian shale bedrock beneath the site is a potential source of water, but is not presently being used. Movement of water in the bedrock is probably to the northeast in the direction of the regional dip.

The principal source of water is the unconsolidated Quaternary outwash materials that overlie the bedrock. These sediments are the St. Joseph Aquifer System, an outwash plain extending from eastern Elkhart County to the boundary of the St. Joseph River drainage basin in western St. Joseph County. The aquifer is composed primarily of fine to medium sand with local layers of coarse sand and gravel. Thicknesses of the aquifer system range from less than 20 feet near the southern boundary to approximately 400 feet near Elkhart. Sand and gravel thicknesses are typically 40 to 120 feet. Numerous thin (3 to 5 feet) layers of clay are interspersed in the main body of outwash.

In the vicinity of the Old Mishawaka Dump, a moderately thick deposit of clay till separates an upper deposit of sand and gravel from a deeper productive sand and gravel aquifer. The clay unit has an irregularly sloping surface that trends generally to the northwest. This clay unit is present in logs of wells east of the site, but is not evident in logs of wells west of the site.

The ground water zone beneath the clay layer is the most productive unit in the South Bend-Mishawaka area. It is extensively used by industrial and municipal wells. The clay layer creates confined hydrostatic conditions where it is present. Where the clay layer is not present, the aquifer is unconfined.

Ground water movement in the vicinity of the site is to the north and northwest toward the St. Joseph River. Hydraulic conductivities in the clay layer are probably in the range of  $10^{-9}$  to  $10^{-5}$  cm/s, which provides a moderate amount of protection for the lower sand and gravel from contamination. Within the aquifer, the sand units have hydraulic conductivities ranging from  $10^{-3}$  to  $10^{-1}$  cm/s and the gravel units range from  $10^{-1}$  to 10 cm/s.

The St. Joseph River is approximately 2,000 feet northwest of the site; however, surface water movement is slow in this area and very little surface run off is likely to reach the river. The site was formerly a wetland area that has been filled. At the southern boundary of the site is an area of permanent standing water that has not been filled. A pond has been constructed just to the southwest of this standing water.

#### SUMMARY AND RECOMMENDATIONS

The Old Mishawaka Dump is located in a wetland that serves as a recharge area for the St. Joseph Aquifer, one of the most important aquifers in Indiana. The glacial outwash beneath the site is relatively permeable. Contaminants could easily migrate off-site or into the ground water, which is close to the surface. Movement of contaminated ground water would probably be to the north or northwest. A large number of industrial or municipal wells are near the site or between the site and the St. Joseph River. Most of these wells are

Tim Heffernan  
March 9, 1989  
Page Three

relatively shallow (50 - 100 feet) and many wells have no intervening clay barrier between the surface and the well screen.

Sampling recommendations include both municipal well fields, the larger field adjacent to the river and the smaller field just 1500 feet southeast of the site. Also any wells that can be found to the northwest between the site and the river should be sampled.

#### REFERENCES

Benton, Hezekiah, Jr., 1977, Soil Survey of St. Joseph County, Indiana, U.S. Department of Agriculture, Soil Conservation Service, 100 p.  
Division of Water, 1987, Water Resource Availability in the St. Joseph River Basin, Indiana, Department of Natural Resources, Division of Water, 139 p.

Hunn, J.D. and Rosenshein, J.S., 1969, Geohydrology and Ground-water Potential of St. Joseph County, Indiana, U.S. Geological Survey, Bulletin No. 33, 20 p.

Peters, James G. and Renn, Danny E., 1988, Effects of Agricultural Irrigation on Water Resources in the St. Joseph River Basin, Indiana, and Implication for Aquifer Yield, U.S. Geological Survey, Water-Resources Investigations Report 37 - 4273, 35 p.

Rosenshein, J.S. and Hunn, J.D., 1962, Ground-water Resources of Northwestern Indiana. Preliminary Report: St. Joseph County, U.S. Geological Survey, Bulletin No. 15, 318 p.

BEG/lal

Attachments



APPENDIX F

INDIANA DEPARTMENT OF NATURAL RESOURCES  
WELL LOGS

APPENDIX F  
INDIANA DEPARTMENT OF NATURAL RESOURCES WELL LOGS

Division of Layne-Western Company, Inc.

**TEST**

☒ PERMANENT

Job No. \_\_\_\_\_

WELL LOG No. 2 CITY Mishawaka County St. Joseph

Owner City of Mishawaka Township Penn

Section 15

### Location

State Indiana

From Land Description South edge Baker Park

From Street or Road Approximately 500' W. of Byrkit

Hole 38+ "Dia Drilled by: { Cable Tool \_\_\_\_\_ Rotary \_\_\_\_\_ Jetting \_\_\_\_\_  
Reverse Circ. X Bucket \_\_\_\_\_ Auger \_\_\_\_\_

Rotary Hole Grouted: Neat Cement     X     Drilling Mud            Other           

Casing 18" "OD From 3 "above ground to 46'9" feet below ground. Weight 70.5 Pounds per foot

Screen 18 " Set from 63 to 46'9" feet Make Layne Type SS Slot .080

Pumping test 703 GPM drawdown to 38.5 feet after 8 hours pumping

Date Completed 10-31-79 Driller Marshall Steele

JOB NO. \_\_\_\_\_

LEVEL

DISTRICT Mishawaka

LOCATION \_\_\_\_\_

South edge Baker Park

Approximately 500' W. of Byrkit

COUNTY St. Joseph

TOWNSHIP Penn

SECTION 15 T 4E R 37N

STATE Indiana

DEPTH 14'

38 "DIA. HOLE

10 ' CONCRETE SEAL

18 " O.D. STEEL WELL  
CASING.  $\frac{3}{8}$  " WALL  
THICKNESS.

GRAVEL FILL

DEPTH 35'

DEPTH 46'9"

Welded SCREEN  
CONNECTION

16'3" FT. OF 18 IN. DIA.  
S.S. Layne  
SCREEN. OPENING .080

SILICA GRAVEL WALL  
16 YDS. SIZE # 48

DEPTH 63'

1/4" steel PLATE  
BOTTOM

[illegible]

FILL USED FROM BOTTOM UP

SILICA GRAVEL PACK	<u>63</u>	TO	<u>35</u>	FT.
GRAVEL FILL	<u>35</u>	TO	<u>14</u>	FT.
CONCRETE	<u>14</u>	TO	<u>4</u>	FT.

STATIC LEVEL 8'

PUMPED 703 G.P.M. AT 38.5 FEET PUMPING LEVEL AFTER 8 HOURS

TYPE OF RIG RC DRILLER M Steele DATE COMPLETED 10-31-79

NOTE: ALL DEPTHS MEASURED FROM GROUND LEVEL. NOT TO SCALE.

**GRAVEL WALL WELL NO. 7 TYPE SC-1**

City of Mishawaka, Indiana - Baker Park

**FOR:**

# LAYNE-NORTHERN

INDIANAPOLIS, IND. • MISHAWAKA, IND. • LANSING, MICH.

DRAWING NUMBER

**SC-1**



extends \_\_\_\_\_ feet above ground level.

**Incorporated**

**[x] TEST**

☐ PERMANENT

Job No. M-6199

WELL LOG No. 16 CITY MISSISSAUGA

County ST. JOSEPH

Owner CITY OF MISSOURI KA

Township PENN

Section

Location

State INDIANA

From Land Description \_\_\_\_\_ ft. East and \_\_\_\_\_ ft. North of SW Corner of Section.

From Street or Road 200' WEST OF BYRITT STREET, 1100' NORTH OF 12th STREET

[illegible]

ed  
TELL No.

Alm Ind.  
1940

ERN C

8

inch diameter hole drilled by ☒ Cable Tool ☐ P.A.

Trail 611638  
TIME 575958

K1

Gen Chem. Station

DIVISION OF WATER  
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA  
STATE OFFICE BUILDING  
INDIANAPOLIS, INDIANA 46204

Telephone 317-232-4160



**WATER WELL RECORD**

**WELL LOCATION**

(Fill in completely - Refer to instruction sheet)

County in which well was drilled St Joseph Civil Township \_\_\_\_\_

Driving directions to the well location: Bendix Aviation Corp. - next to water tower  
Include County Road Names, Numbers, Subdivision Name, lot number, distinct landmarks, etc.

**NAME OF WELL OWNER and/or BUILDING CONTRACTOR**

Well Owner Bendix Aviation Corp. Address \_\_\_\_\_

Building Contractor \_\_\_\_\_ Address \_\_\_\_\_

Name of Well Drilling Contractor: Layne - Northern Co, Inc.

Address \_\_\_\_\_

Name of Drilling Equipment Operator: \_\_\_\_\_

**WELL INFORMATION**

Depth of well: 164 Date well was completed: 11-24-53

Diameter of casing or drive pipe: 4 Total Length: \_\_\_\_\_

Diameter of liner (if used): \_\_\_\_\_ Total Length: \_\_\_\_\_

Diameter of Screen: \_\_\_\_\_ Length: \_\_\_\_\_ Slot Size: \_\_\_\_\_

Type of Well: Drilled ☒ Gravel Pack ☐ Driven ☐ Other \_\_\_\_\_

Use of Well: For Home ☒ For Industry ☐ For Public Supply ☐ Stock ☐

Method of Drilling: TEST Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☐ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) 14 ft.

Bailer Test: Hours Tested \_\_\_\_\_ Rate \_\_\_\_\_ g.p.m. Drawdown \_\_\_\_\_ ft. (Drawdown is the difference between static level and water level at end of test)

Pumping Test: Hours Tested \_\_\_\_\_ Rate \_\_\_\_\_ g.p.m. Drawdown \_\_\_\_\_ ft.

Signature Kathy Thalmann

Date 1-11-83

Copied from St. Joe County Bulletin #15

## 5

**(Well driller does not fill out)**

Base Map

119210  
559505

DIVISION OF WATER  
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA  
STATE OFFICE BUILDING  
INDIANAPOLIS, INDIANA 46204  
Telephone 633-5267 Area Code 317



## WATER WELL RECORD

### WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled St. Joseph Civil Township Penn  
Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distant landmarks, etc.

1/4 mile West of Fir Rd. on Harrison Rd. to S. Industrial Dr. turn S. 4th business on

East side

### NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner THERMOPLASTIC, INC. Address 1400 S. Industrial Dr. Mishawka, IN

Building Contractor \_\_\_\_\_ Address \_\_\_\_\_

Name of Well Drilling Contractor: GEORGE P. REID & SON

Address Box 5 Howe, IN 46746

Name of Drilling Equipment Operator: Mr. Todd Gotshall

### WELL INFORMATION

Depth of well: 53 Date well was completed: 1/23/78

Diameter of casing or drive pipe: 4" Total Length: ~~16X~~ 37'

Diameter of liner (if used): ----- Total Length: -----

Diameter of Screen: 3 7/8" Length: 16 feet Slot Size: 15

Type of Well: Drilled ☒ Gravel Pack ☐ Driven ☐ Other: \_\_\_\_\_

Use of Well: For Home ☐ For Industry ☒ For Public Supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☒ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) 8'-6"

Bailer Test: Hours Tested --- Rate --- g.p.m. Drawdown --- ft.

Pumping Test: Hours Tested --- Rate --- g.p.m. Drawdown --- ft.

(Drawdown is the difference between static level and level at end of test)

Signature William T. Reid

Date February 20, 1978

# WATER WELL LOG

**(Well driller does not fill out)**

COUNTY

**TWP.**

**RGE.**

2.

4

SEC

Subdivision Name

## Topo Map

Field Located

**By**

Date \_\_\_\_\_

### Courthouse Location By

Date \_\_\_\_\_

Location accepted w/o verification by

## Fiw of EL

## FIN of SL.

### Fi E of WL.

## FIS of NL.

### Ground Elevation

**Depth to bedrock.**

**Bedrock elevation**

**Aquifer elevation.**

10

---

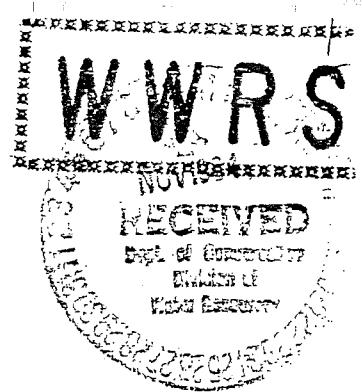
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Lot Number \_\_\_\_\_

Base Map

61P 900  
562500

DIVISION OF WATER RESOURCES  
INDIANA DEPARTMENT OF CONSERVATION  
609 STATE OFFICE BUILDING  
INDIANAPOLIS, INDIANA 46209  
MELROSE 3-6757



WATER WELL RECORD

INFORMATION ON WELL LOCATION

County in which well was drilled: St. Joseph Civil Township: Penn

Congressional township: \_\_\_\_\_ Range: \_\_\_\_\_ Number of section: \_\_\_\_\_

(Fill in as completely as possible)

Describe in your own words the well location with respect to nearby towns, roads, streets

or distinctive landmarks: South of Mishawaka just outside of city limits

on South Main St. Mishawaka 1 block <sup>North</sup> south of

16th Street

Name of owner: \_\_\_\_\_ Address: Mishawaka, Ind.

Name of Well Drilling Contractor: B. Kamm Co.

Address: 1234 Chimes Blvd.

Name of Drilling Equipment Operator: William M. Kamm

INFORMATION ON THE WELL

Completed depth of well: 53 ft. Date well was completed: 11/4/64

Diameter of outside casing or drive pipe: 3" Length: 49

Diameter of inside casing or liner: \_\_\_\_\_ Length: \_\_\_\_\_

Diameter of Screen: 2" Length: 4' Slot size: 10

Type of Well: Drilled ☒ Gravel Pack ☐ Driven ☐ Other \_\_\_\_\_

Use of Well: For home ☒ For industry ☐ For public supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☒ Driven ☐

Static water level in completed well (Distance from ground to water level) 8 ft.

Bailer Test: Hours tested \_\_\_\_\_ Rate \_\_\_\_\_ g.p.m. Drawdown \_\_\_\_\_ ft. (Difference between

Pumping Test: Hours tested 1 Rate 15 g.p.m. Drawdown 5 ft. static level and water level at end of test)

Signature William Kamm

Date 11-6-64

## WATER WELL LOG

[illegible]

## INSTRUCTIONS

This Water Well Record form is designed to record the most essential data concerning a water well. We request that you be as accurate as possible in recording this information as it may be of great assistance in the planning and development of new water supplies.

An accurate location of the well is equally as important as an accurate well log. Please include all information possible in the space provided for well location.

As specified in Chapter 6 of the Acts of 1959, a copy of this report must be submitted within thirty days after the completion of a well to the Division of Water Resources, Indiana Department of Conservation.

Base Ma.

DIVISION OF WATER RESOURCES  
INDIANA DEPARTMENT OF CONSERVATION  
609 STATE OFFICE BUILDING  
INDIANAPOLIS, INDIANA 46209  
MElrose 3-6757

WATER WELL RECORD

INFORMATION ON WELL LOCATION

County in which well was drilled: St. Joseph Civil Township: Centre

Congressional township: \_\_\_\_\_ Range: \_\_\_\_\_ Number of section: \_\_\_\_\_  
(Fill in as completely as possible)

Describe in your own words the well location with respect to nearby towns, roads, streets  
or distinctive landmarks: Located on Bremen Highway on the East side of the road about  
2 miles north of Kern Road

Name of owner: \_\_\_\_\_ Address: \_\_\_\_\_

Name of Well Drilling Contractor: Sniver Drilling Co.

Address: 59755 Market Street, So. Bend, Indiana

Name of Drilling Equipment Operator: Carson Sarvari

INFORMATION ON THE WELL

Completed depth of well: 110 ft. Date well was completed: \_\_\_\_\_

Diameter of outside casing or drive pipe: 2 in Length: 106.0

Diameter of inside casing or liner: \_\_\_\_\_ Length: \_\_\_\_\_

Diameter of Screen: 1 1/4 Length: 40 Slot size: 10

Type of Well: Drilled ☒ Gravel Pack ☐ Driven ☐ Other \_\_\_\_\_

Use of Well: For home ☒ For industry ☐ For public supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☒ Driven ☐

Static water level in completed well (Distance from ground to water level) \_\_\_\_\_ ft.

Bailer Test: Hours tested 1 Rate 15 g.p.m. Drawdown \_\_\_\_\_ ft. (Difference between  
static level and water

Pumping Test: Hours tested \_\_\_\_\_ Rate \_\_\_\_\_ g.p.m. Drawdown \_\_\_\_\_ ft. level at end of test)

Signature Carson R. Sarvari

Date \_\_\_\_\_



4

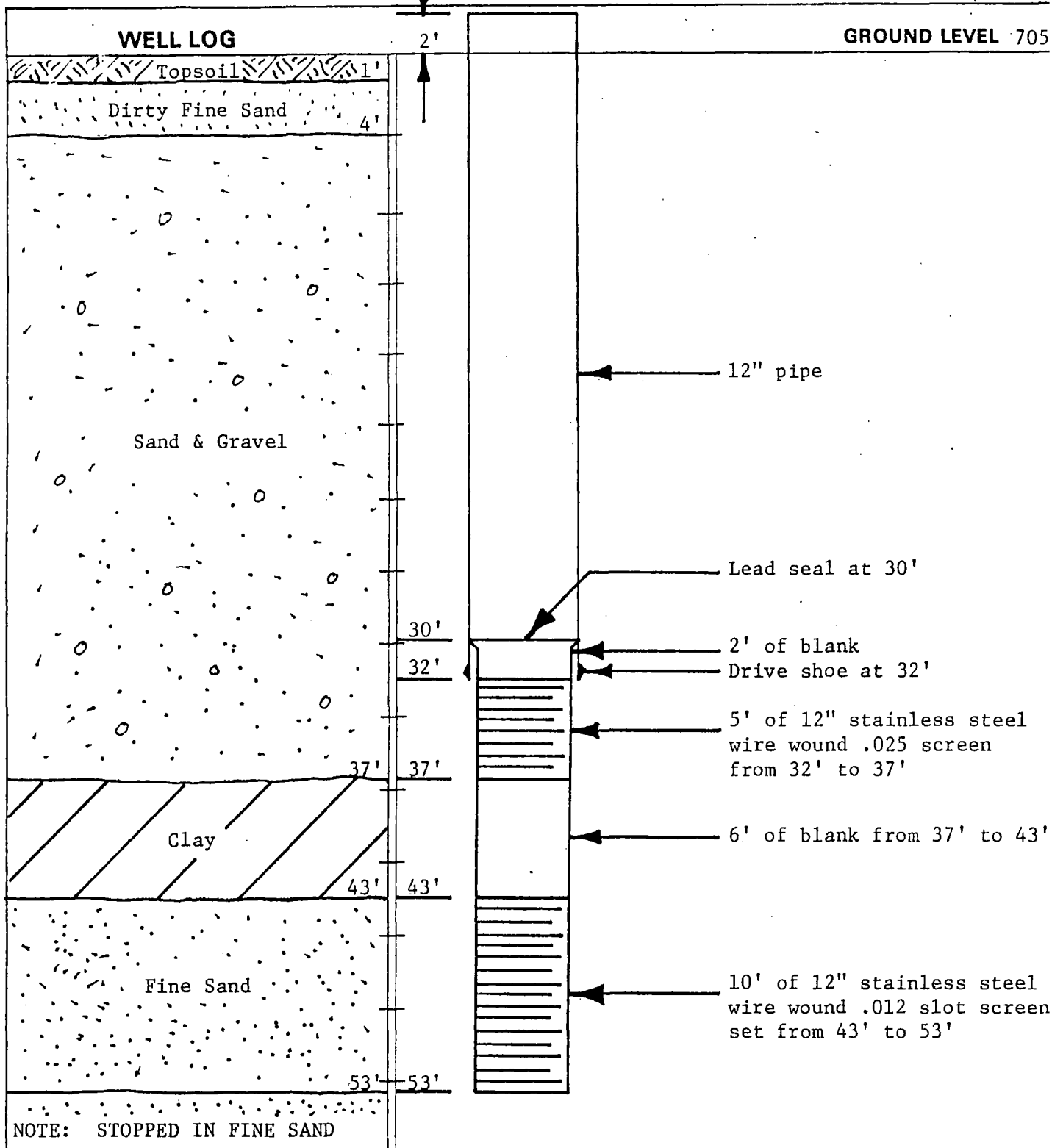
(Well driller does not fill out)

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An accurate location of the well is equally as important as an accurate well log. Please include all information possible in the space provided for well location.

As specified in Chapter 6 of the Acts of 1959, a copy of this report must be submitted within thirty days after the completion of a well to the Division of Water Resources, Indiana Department of Conservation.



City Mishawaka State Indiana

Location 165' East of Virgil Street (Extended); 360' North of Linden Street

County St. Joseph Twp. Penn; T37N, R3E Section NE1/4NW1/4 of 14

Test Capacity 146 GPM. Static Water Level 32 ft. Pumping Level 50 ft.

Specific Capacity 8.1 GPM/Ft. D.D.

Date Drilled 8/21/86

Driller M. Garrage

Job No. 5897

Well No. INTERCEPTOR WELL #2

CITY OF MISHAWAKA  
VIRGIL STREET WELL FIELD  
MISHAWAKA, INDIANA

**PEERLESS-MIDWEST, INC.**  
Granger, Indiana

# WATER WELL LOG

570600 E

(Well driller does not fill out)

Subdivision Name

COUNTY

TWP.

RGE.

3E

N2E 1/4

1/4

1/4

1/4

1/4

1/4

1/4

1/4

1/4

1/4

1/4

1/4

Topo Map

Section 3 and 4 E 7 1/2

Ft W of EL.

N2E 1/4

1/4

1/4

1/4

1/4

1/4

1/4

1/4

1/4

1/4

1/4

1/4

Field Located

By

Date

Courthouse Location

By

Date

Location accepted w/o verification by

To

1'

4'

37'

43'

53'

-

From

0'

1'

4'

37'

43'

53'

FORMATIONS (Color, type of material, hardness, etc.)

Topsoil

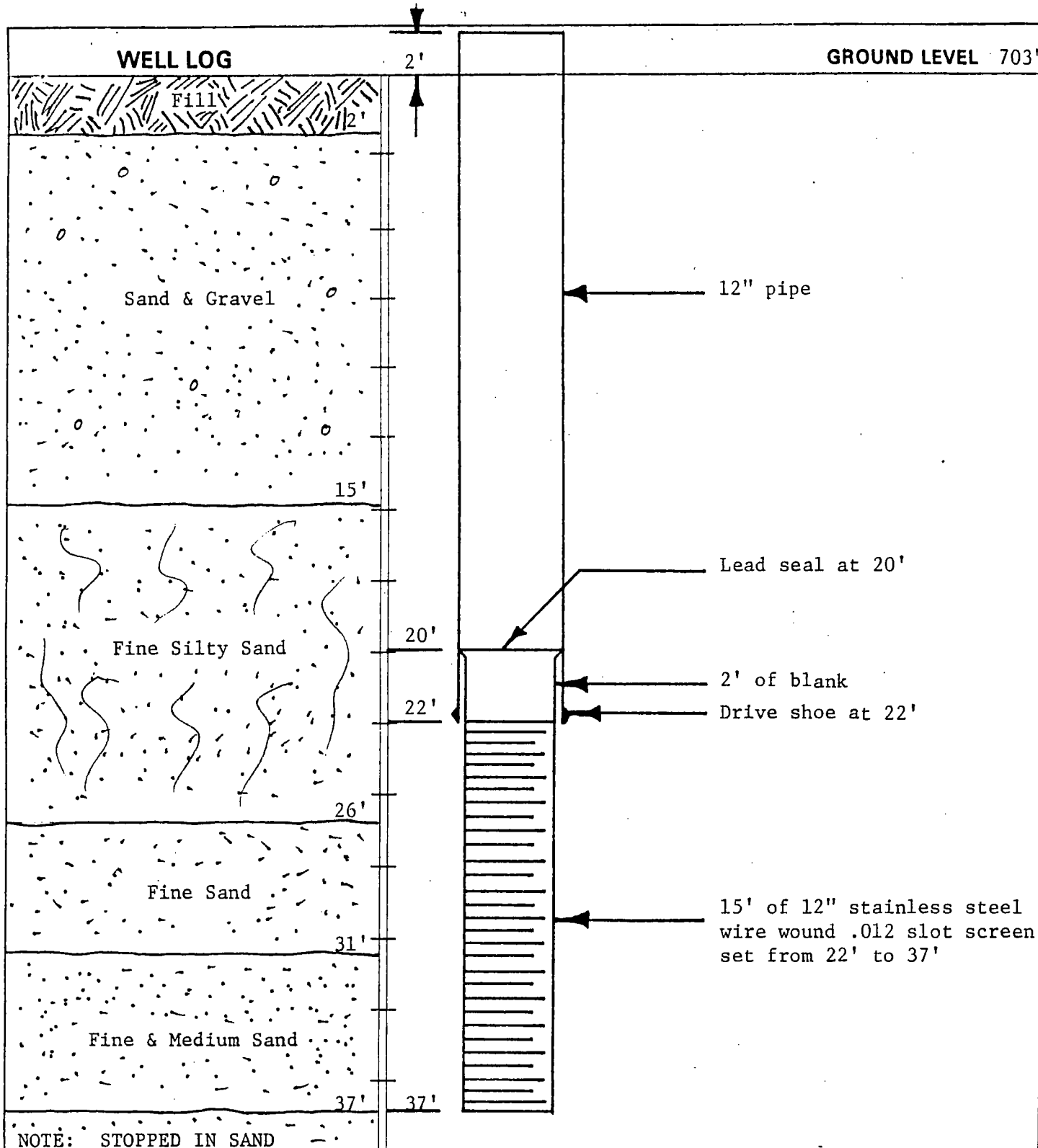
Dirty Fine Sand

Sand & Gravel

Clay

Fine Sand

Stopped in Sand



City Mishawaka State Indiana

Location 210' West of Virgil Street (Extended); 200' North of Linden Street

County St. Joseph Twp. Penn; T37N, R3E Section NE $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$  of 14

Test Capacity 84 GPM. Static Water Level 24 ft. Pumping Level 33 ft.

Specific Capacity 9.3 GPM/Ft. D.D.

Date Drilled 8/15/86

Driller M. Garrage

Job No. 5897

Well No. INTERCEPTOR WELL #1

CITY OF MISHAWAKA  
VIRGIL STREET WELL FIELD  
MISHAWAKA, INDIANA

**PEERLESS-MIDWEST, INC.**  
Granger, Indiana

## 49

**(Well driller does not fill out)**

510420

# WATER WELL LOG

Material, hardness, etc.)

From

To

Acc. w/o v  
Well log cl  
Courthouse  
Field loca

opo Map: —  
UNITY: —

## LAYNE-NORTHERN COMPANY

Incorporated

MISHAWAKA, INDIANA

- ☐ TEST  
☒ PERMANENT

Job No. 111,392

WELL LOG No. \_\_\_\_\_ CITY Mishawaka County St. Joseph  
Owner Gas Laboratory Township Penn 37N  
1408. Byrkit Ave Mishawaka Section NE NW SW 1  
Location State Indiana

From Land Description 900 ft. East and 2000 ft. North of SW Corner of Section  
From Street or Road 100' E. of Byrkit St. and 100' N. of VETERA tracks  
Near SW corner of Plat 61

FORMATION FOUND — DESCRIBE FULLY	FROM NATURAL GROUND LEVEL			
	Depth to Top of Stratum	Depth to Bottom of Stratum	Thickness of Stratum	Static Water Level
Black Top Soil	0	2	2	
Sand & Gravel with boulders	2	28	26	
<u>Gray Clay</u>	28	44	16	
Sand and Gravel	44	62	18	
<u>Gray Clay with boulders</u>	62	73	11	
Sand and Gravel	73	78	5	
<u>Gray Clay</u>	78	85	7	
Sand & Gravel	85	88	3	
<u>Gray Clay with boulders</u>	88	92	4	
Sand and Gravel	92	95	3	19
<u>Gray Clay</u>	95	103	8	
Sand & Gravel	103	107	4	19
<u>Gray Clay</u>	107	110	3	
Sand & Gravel	110	113	3	19
<u>Gray Clay</u>	113	116	3	
Sand & Gravel	116	117	1	19
<u>Clay with boulders</u>	117	120	3	
Sand and Gravel	120	122	2	19
<u>Gray Clay</u>	122	123	1	
Sand and Gravel	123	134	11	19
Med. & Fine Sand	134	138	4	19

26x12 inch diameter hole drilled by ☐ Cable Tool ☒ Rotary ☐ \_\_\_\_\_

fe left in hole

(Well driller does not fill out)

Ground elevation \_\_\_\_\_

725'

1 concern  
informat  
plies.  
well log  
ion.  
st be su  
Resources

Base M



COMPANY  
SING W W R S  
Job No. 12593

Job No. 12593

County St. Joe

Range 3 E Township Penn 37 N

### Location

State\_\_\_\_\_Ind\_\_\_\_\_

From Land Description 8<sup>1</sup> No. of R & D Bldg.

From Street or Road 200' east of Byrkit Ave.

Hole 32 "Dia Drilled by: { Cable Tool \_\_\_\_\_ Rotary \_\_\_\_\_ Jetting \_\_\_\_\_  
Reverse Circ. \_\_\_\_\_ Bucket X \_\_\_\_\_ Auger \_\_\_\_\_

Rotary Hole Grouted: Neat Cement \_\_\_\_\_ Drilling Mud \_\_\_\_\_ Other \_\_\_\_\_

Casing 123/4" OD From 24 "above ground to 28 feet below ground. Weight 49.5 Pounds per foot

Screen 12 " Set from 28 to 53 feet Make Cook Type 55 Slot #60

Pumping test 703 GPM drawdown to 35' feet after 6 hours pumping

Date Completed 6/14/69 Driller Dick Kent

[illegible]

This Water Well Record form is designed to record the most essential data concerning water well. We request that you be as accurate as possible in recording this information. It may be of great assistance in the planning and development of new water supplies.

An accurate location of the well is equally as important as an accurate well log. Please include all information possible in the space provided for well location.

As specified in Chapter 6 of the Acts of 1959, a copy of this report must be submitted within thirty days after the completion of a well to the Division of Water.



# LAYNE-NORTHERN COMPANY

Incorporated

MISHAWAKA, INDIANA

☐ \*TEST

☐ PERMANENT

WELL LOG No. 654 CITY Mishawaka

Owner Wheelabrator Corp.

440 S. Byrkit - Mishawaka

Location

County

Township

Section 14 - R

State Ind

From Land Description \_\_\_\_\_ ft. East and \_\_\_\_\_ ft. North of SW Corner of

From Street or Road Approx. 200' SW of foundry

FORMATION FOUND — DESCRIBE FULLY	FROM NATURAL GROUND LEVEL		
	Depth to Top of Stratum	Depth to Bottom of Stratum	Thickness of Stratum
Top Soil	0	1	1
Gravel and boulders	1	27	26
Coarse Sand	27	29	2
Coarse Gravel	29	37	8
Clay	37	49	12
Fine Sand	49	61	12
Clay	61	67	6
Fine Sand	67	68	1
Clay and Boulders	68	72	4
Coarse Sand and Gravel	72	83	11
Clay and Boulders	83	88	5
Coarse Gravel	88	89	1
Clay and Boulders	89	110	21
Coarse sand and gravel	110	122	12
Fine Sand	122	124	2
Coarse Gravel	124	132	8
Fine Sand	132	136	4
Stopped in fine sand	136		

\_\_\_\_ inch diameter hole drilled by ☐ Cable Tool ☐ Rotary ☐ Jetting  
 Pipe left in hole None

Date Started 4-19-65

Finished 4-30-65

Paul Wynn

DRILLER

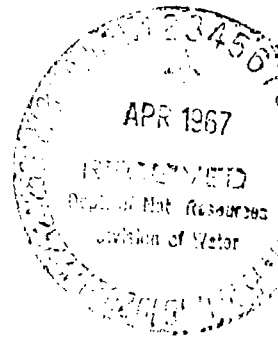
[illegible]

This Water Well Record form is designed to record the most essential data concerning a water well. We request that you be as accurate as possible in recording this information as it may be of great assistance in the planning and development of new water supplies.

An accurate location of the well is equally as important as an accurate well log. Please include all information possible in the space provided for well location.

As specified in Chapter 6 of the Acts of 1959, a copy of this report must be submitted within thirty days after the completion of a well to the Division of Water Resources, Indiana Department of Conservation.

DIVISION OF WATER  
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA  
STATE OFFICE BUILDING  
INDIANAPOLIS, INDIANA 46209  
MElrose 3-6757  
**WATER WELL RECORD**



INFORMATION ON WELL LOCATION

County in which well was drilled: St. Joseph Civil Township: Penn  
Congressional township: \_\_\_\_\_ Range: \_\_\_\_\_ Number of section: \_\_\_\_\_  
(Fill in as completely as possible)  
Describe in your own words the well location with respect to nearby towns, roads, streets  
or distinctive landmarks: South east of Mishawaka, inside City Limits  
Drilled on 5th St., 2 blocks west of Byrkit Street

Name of owner: Dearborn Fab. Steel Address: Fifth St., Mishawaka, Indiana  
Name of Well Drilling Contractor: B. KAMM CO.  
Address: 1234 Chimes Blvd.  
Name of Drilling Equipment Operator: William M. Kamm

INFORMATION ON THE WELL

Completed depth of well: 53 ft. Date well was completed: 2/2/67  
Diameter of outside casing or drive pipe: 2" Length: 49'  
Diameter of inside casing or liner: \_\_\_\_\_ Length: \_\_\_\_\_  
Diameter of Screen: 1 1/4 Length: 4' Slot size: 10  
Type of Well: Drilled ☒ Gravel Pack ☐ Driven ☐ Other \_\_\_\_\_  
Use of Well: For home ☐ For industry ☒ For public supply ☐ Stock ☐  
Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☒ Driven ☐  
Static water level in completed well (Distance from ground to water level) 20 ft.  
Bailer Test: Hours tested \_\_\_\_\_ Rate \_\_\_\_\_ g.p.m. Drawdown \_\_\_\_\_ f. (Difference between  
static level and water  
Pumping Test: Hours tested 1 Rate 10 g.p.m. Drawdown 0 ft. level at end of test)

Signature William M. Kamm  
Date 3/29/67

**FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET**

[illegible]

As specified in Chapter 6 of the Acts of 1959, a copy of this report must be submitted within thirty days after the completion of a well to the Division of Water



## WATER WELL LOG

From

To

Location

County

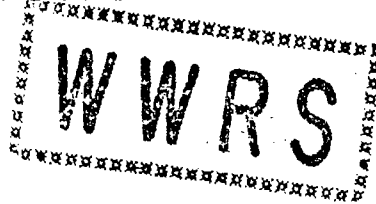
Field Loc

Topo Map

COUNTY -

562587

DIVISION OF WATER  
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA  
STATE OFFICE BUILDING  
INDIANAPOLIS, INDIANA 46204  
Telephone 633-5267 Area Code 317



## WATER WELL RECORD

## WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled St. Joseph Civil Township Penn Sec 15 26Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

225' E. of Union St. approx 100' S. of Penn Central RR  
in Mishawaka

## NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner Dodge Mfg. Address S. Union St. - Mishawaka

Building Contractor \_\_\_\_\_ Address \_\_\_\_\_

Name of Well Drilling Contractor: Peerless - Midwest, Inc.Address: Manger, Ind.Name of Drilling Equipment Operator: Paul Wyatt

## WELL INFORMATION

Depth of well: 72' Date well was completed: 5-31-73Type of casing or drive pipe: HALE 42" Total Length: 70'Type of liner (if used): 12" Total Length: 52'Type of screen: 12 Length: 20' Slot Size: Top 10' - .030  
Bottom 10' - .060How drilled: ☒ Drilled ☒ Gravel Pack ☐ Driven ☐ Other \_\_\_\_\_For Home ☐ For Industry ☒ For Public Supply ☐ Stock ☐Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☒ Jet ☐ Bucket Rig ☐Water level in completed well (Distance from ground to water level) 15 feet

Hours Tested \_\_\_\_\_ Rate \_\_\_\_\_ g.p.m. Drawdown \_\_\_\_\_ ft.

Hours Tested 8 Rate 1000 g.p.m. Drawdown 17 1/2 ft.

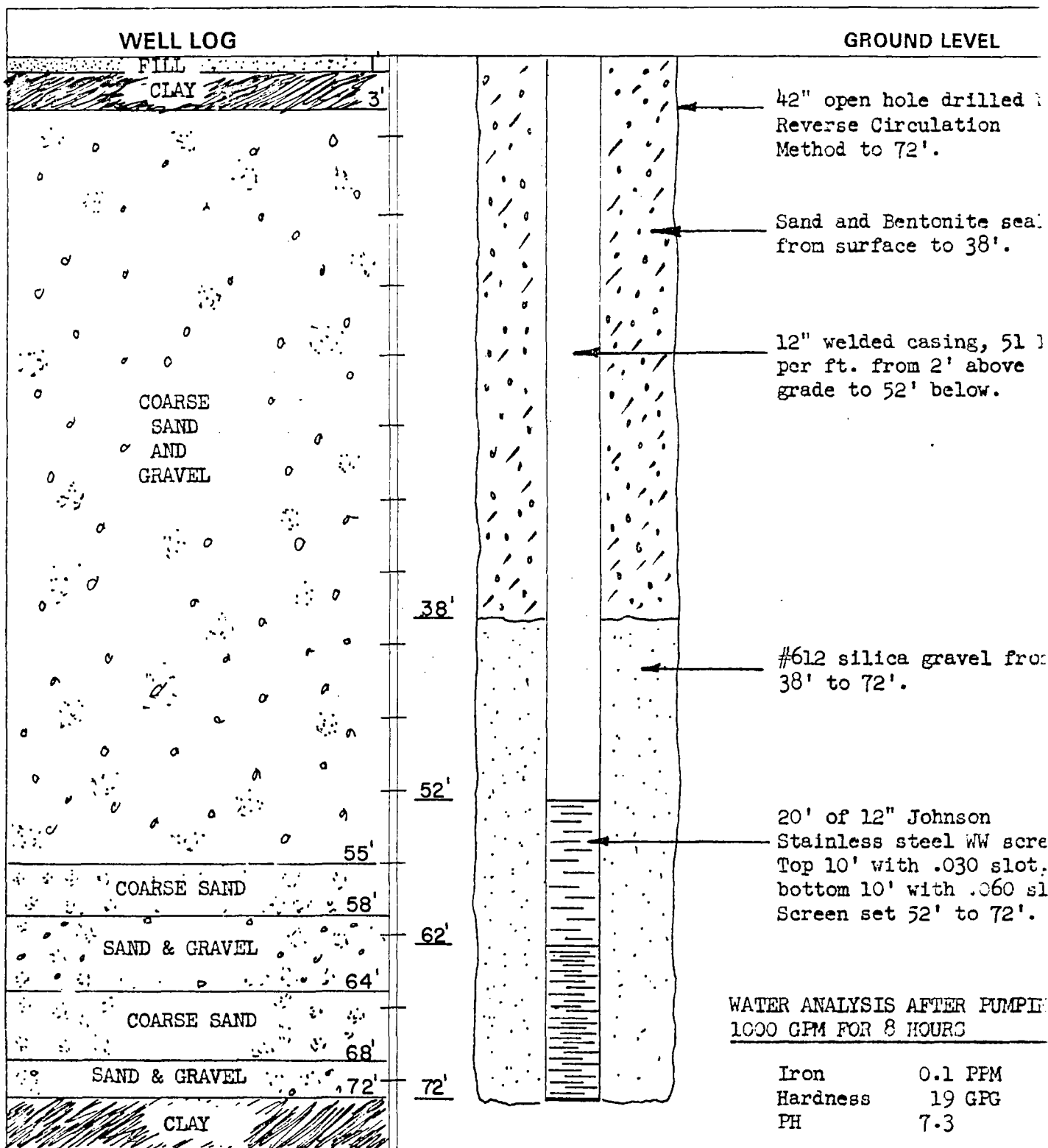
(Drawdown is the difference between static level and water level at end of test)

Signature Robert J. WilliamsDate 6-14-73FOR ADMINISTRATIVE USE ONLY  
(Well driller does not fill out)

Ground Elevation

SEC 15  
TWP 26  
RANGE 3E  
Peerless  
4-25-73

Map



City Mishawaka State Indiana

Location 225' E. of Union Street & 15' N. of Bldg. #7 - NW side of Property - Site of TW 73B

County St. Joseph Twp. Penn Section 25 R3E T37N

Test Capacity 1000 GPM. Static Water Level 15 ft. Pumping Level 37.5 ft.

Specific Capacity 44.44 GPM/Ft. D.D.

Date Drilled May 31, 1973

Driller Paul Wyatt

Job No. 54

Well No. 4

DODGE MFG. DIV. OF RELIANCE

MISHAWAKA, INDIANA

PEERLESS-MIDWEST, INC.  
Granger, Indiana

1. The following information was obtained from the records of the Department of the Interior, Bureau of Land Management, regarding the land owned by the United States in the State of California:

... .. **CONFIDENTIAL LEVEL** ... ..

[illegible]

Signature: \_\_\_\_\_ Date completed: \_\_\_\_\_

... "sacred" and "secular" ...

screen recommended from 1998 to 2002

[illegible]

Received 15 November 2004; accepted 12 January 2005; first published online 12 April 2005





**PEERLESS-MIDWEST, INC.** Water Supply Contractors  
51255 BITTERSWEET ROAD / GRANGER, INDIANA 46530 / 219 272-9050

## TEST DRILLING REPORT

Well No. 73 B City Mishawaka County St. Joseph

Owner Dodge Mfg. Div. of Reliance Electric Township Penn

Section \_\_\_\_\_

Location \_\_\_\_\_ State Indiana

North Side of Plant - Approximately 150' east of Union Street and 125' south of RR

### GRADE ELEVATION ABOVE MEAN SEA LEVEL —

FORMATION	Top of Formation	Bottom of Formation	Thickness	Static Water Level	50% SIZE
Concrete	0	1	1		
Fill	1	5	4		
Coarse gravel and sand (dirty)	5	14	9		
Sand and gravel w/silt	14	25	11	15'	
Sand and gravel medium	25	42	17	15'	.024
Coarse sand and gravel	42	54	12	15'	.042
Brown coarse sand	54	72	18	15'	.013
Clay	72	78	6		
Test well pumped at 180 gpm with 54' pumping level for 4 hours before taking water samples.					

8 " Dia. hole drilled by Cable Tool Date completed 4-25-73

8 " casing set to 62 8 " screen set from 62 ' to 72

20 ft. of 12" WW screen recommended from 44' to 54' and 62' to 72'

Recommended screen slot size: Tubular well \_\_\_\_\_ Gravel Pack well .060 upper  
.030 lower

Water analysis: Iron 0.2 PPM, hardness 17 GPG, PH 7.4

Job No. 54 Driller Dick Kent

APPENDIX G

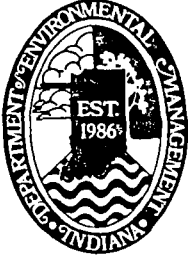
UNIROYAL RESPONSE TO IDEM INFORMATION REQUEST

APPENDIX G

UNIROYALS' RESPONSE TO IDEM INFORMATION REQUEST

APPENDIX H

UNIROYALS' RESPONSE TO IDEM INFORMATION REQUEST



# INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

NANCY A. MALOLEY, Commissioner

105 South Meridian Street  
P.O. Box 6015  
Indianapolis 46206-6015  
Telephone 317-232-8603

February 14, 1989

Mr. Richard Carpenter  
Uniroyal Plastics, Inc.  
312 North Hill Street  
Mishawaka, Indiana 46544

Re: "Old Mishawaka Dump"

Dear Mr. Carpenter:

The Site Investigation Section of the Indiana Department of Environmental Management is requesting your assistance in evaluating the possible need for remedial action at the site known as "Old Mishawaka Dump" located at 1131 5th Street, Mishawaka, Indiana.

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 was created to provide liability, compensation, cleanup, and emergency response for hazardous substances released into the environment and the cleanup of abandoned and uncontrolled hazardous waste sites.

The above-mentioned site is currently included on the Comprehensive Environmental Response, Compensation, and Liability Inventory System (CERCLIS) List of the State of Indiana. Under the terms of the PA/SI Cooperative Agreement between the State and the U.S. Environmental Protection Agency, the CERCLIS Program allows the State to participate in the CERCLA site screening process. This process establishes a system to determine whether or not a specific site poses a significant threat to public health and the environment.

This section desires information pertaining to:

1. Hazardous substances generated, stored, treated, handled or disposed of on this site.
2. Waste treatment facilities operated, past and present, on the site, e.g. landfills, surface impoundments, seepage pits, etc.

Information already obtained by the State indicates that Uniroyal utilized the site for waste disposal during the period 1947-1954.

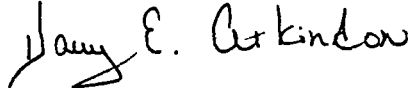
This request is made pursuant to the authority granted to the State of Indiana under Section 104 of CERCLA (42 USC 9604 et. seq.). Please refer to Section 103 of CERCLA for your responsibilities in regard to this matter.

An Equal Opportunity Employer

Mr. Richard Carpenter  
Page 2  
February 14, 1989

Your reply is requested within thirty (30) days upon receipt of this letter. If you have any questions, please direct them, as well as your reply to Mr. Tim Heffernan of the Site Investigation Section at AC 317/232-8902.

Very truly yours,

A handwritten signature in cursive script, appearing to read "Harry E. Atkinson".

Harry E. Atkinson, Chief  
Site Investigation Section  
Policy and Planning Branch  
Solid and Hazardous Waste Management

TH/lea

SHUMWAY & MERLE

ATTORNEYS AT LAW  
2425 POST ROAD, SUITE 205  
SOUTHPORT, CT 06490

MAR 20 9 25 AM '89

RECEIVED  
AND  
MAILED  
MAR 20 1989

TELEPHONE (203) 255-7444  
FACSIMILE (203) 255-0365

March 13, 1989

Mr. Tim Heffernan  
Site Investigation Section  
Solid and Hazardous Waste Management  
Indiana Department of Environmental Management  
105 South Meridian Street  
P.O. Box 6015  
Indianapolis, IN 46206-6015

Re: "Old Mishawaka Dump"

Dear Mr. Heffernan:

This letter is in response to the February 14, 1989 letter from Harry E. Atkinson of your office which requested information relating to the Old Mishawaka Dump, with a stated location at 1131 5th Street, Mishawaka, Indiana. This response is filed for and on behalf of Uniroyal Plastics Company, Inc. By way of explanation, Uniroyal Plastics Company, Inc. now owns and operates the manufacturing facility located in Mishawaka, Indiana that was previously owned and operated by Uniroyal, Inc. (U.S. Rubber Company).

As an initial matter, we note nothing in our files to indicate the address referenced in Mr. Atkinson's letter. We do however have information relating to a site referred to as the Mishawaka landfill at 8th Street, near Wenger Street. Other documents reference a "Ball-Band Dump" which we believe to have been a portion of the larger Mishawaka city landfill at that location. On the assumption that this is the same site as that referenced in the letter from Mr. Atkinson, the following information is provided.

Obviously, due to the enormous lapse of time since any activity at the site, our records are by no means complete. Surprisingly, however, we have located some records which appear to be somewhat responsive to the information requested, and these are enclosed herewith. Unfortunately, we have no waste analyses relating to the materials referenced therein as having been disposed at the city landfill on 8th Street by the Mishawaka plant of U.S. Rubber (now owned by Uniroyal Plastics). By providing the enclosed information, therefore, we do not in any sense concede nor admit that the materials disposed at the site, if any, were hazardous substances under current legal definitions

Mr. Tim Heffernan  
March 13, 1989  
Page 2

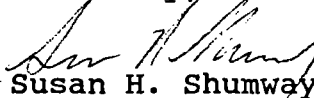
and reserve the right to dispute any such characterization at any time in the future.

Further, we note that in April 1988 Uniroyal Plastics was informed by the City of Mishawaka Fire Department that excavation at the site in March 1988 had encountered several drums containing an odorous greenish liquid. Further details are unavailable to us but presumably are in the hands of the Fire department. We have, however, investigated the use of drums from the Mishawaka plant as best as can be done at this late date and our best information is that as a rule wastes from the facility were not disposed in drums, but rather drums were reused at the plant. We believe that the majority of the wastes disposed at the site came from other sources, including the City of Mishawaka and private haulers used by area commercial and industrial establishments, and believe that others may account for the presence of any drums disposed at the site.

We would appreciate receiving any information gathered thus far by the State that relates to its contention that "Uniroyal used the site for waste disposal during the period 1947 to 1954". This could assist us in determining whether any additional investigations into the issues presented might be warranted as well as assisting us in determining how such investigations could be conducted.

Please feel free to contact the undersigned should you have any additional questions relating to this matter.

Sincerely,

  
Susan H. Shumway





UNIROYAL PLASTICS COMPANY, INC.

312 North Hill Street

P.O. Box 2000

Mishawaka, Indiana 46544-1399

August 27, 1986

Dept. of Engineering, Mishawaka City Hall  
600 E. Third Street  
Mishawaka, IN 46544-2241

Attention: Theresa E. Harrison, P.E.  
Assistant City Engineer

Re: Landfill, 8th Street

Dear Ms. Harrison:

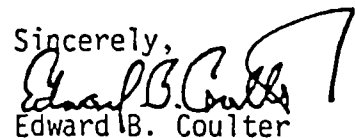
Per your request of August 4, 1986 regarding landfill operations on 8th Street, our meager records concerning waste operations following World War II indicate the following:

1. UNIROYAL (United States Rubber Company) disposed of factory waste at an open dump site in the 1100 block of 8th Street near Wenger Street. The site was used between 1946 and 1951.
2. The City dumped at the same site and their heavy use started to exhaust the site, prompting UNIROYAL to seek another location.
3. Discussions were held with the City on installation of an incinerator but nothing materialized.
4. No record of a formal agreement with the City to dump at the open site could be located.
5. The only indication of volume and types of waste comes from a survey conducted for one month (December 18, 1946 to January 18, 1947). The following materials & volumes were recorded:
  - A. Tin cans, steel shavings, sawdust, and excelsior 31,500 Lbs.
  - B. Cements (natural and synthetic rubber - vulcanized), fuel cell rubber cuttings, automat rubber scrap. 162,500 Lbs.
  - C. Wool cuttings and jute scrap. 89,000 Lbs.

D. Fabric and rubberized fabric (unvulcanized)	311,000 Lbs.
E. Rubber flash from heels and soles, foam sponge, latex scrap, laminac resin scrap.	8,500 Lbs.
F. Paper, cardboard, wood boxes, general floor sweepings.	532,000 Lbs.
G. Ashes and cinders	26,500 Lbs.
Total	<u>1,161,000 Lbs.</u>

Please call if you have any further concerns regarding the above.

Sincerely,



Edward B. Coulter

Mgr., Maintenance & Facilities

maa

cc: K. B. Fletcher  
~~R. L. Carpenter~~  
 S. H. Shumway - World Headquarters A-G-1

March 11, 1948

Professor J. A. Reyniers  
Department of Bacteriology  
Notre Dame University  
Notre Dame, Indiana

EX 2

Dear Professor Reyniers:

Referring to the information concerning scrap hauled to the Ball-Band dump, I find that this information was not sent to you. You will note that the record of scrap listed below refers to a period of one month, from December 18, 1946 to January 18, 1947. This is the most recent record of scrap which we have, but in the opinion of those who handle the scrap, the present percentages would not be far away from those listed below:

Scrap Hauled to Ball-Band Dump From December 18, 1946 to January 18, 1947

<u>Group</u>		<u>Lbs.</u>	<u>%</u>
1	Tin Cans ) Steel Shavings ) Saw Dust ) Excelsior )	31,500	2.7
2	Cements ) Fuel Cell Rubber Cuttings ) Auto Mat Rubber Scrap )	162,500	14.0
3	Wool Cuttings and Shoddy ) Jute Scrap )	89,000	7.7
4	Fabric and Rubberized Fabric	311,000	26.8
5	Rubber Flash From Heel and Sole ) Foam Sponge and Latex Scrap ) Laminac Resin Scrap )	8,500	.7
6	Paper ) Cardboard and Wood Boxes ) General Floor Sweepings from ) Sanitary Department )	532,000	45.8
7	Ashes and Cinders	26,500	2.3
		<u>1,161,000</u>	<u>100.0%</u>

Some of the items of scrap listed above are self-explanatory. In the case of others, you perhaps will wish to have a more detailed description. In Group 2, the cements are natural and synthetic rubber cements which have been vulcanized. They comprise only a small percentage of the total. Fuel Cell rubber cuttings consist of fabric and synthetic rubber combinations. The auto

Professor J. A. Reyniers

-2-

March 11, 1948

mat rubber scrap is the biggest-item in this group, and it consists of vulcanized auto mat scrap which is made primarily from reclaimed rubber and clay. All of these materials, of course, contain an appreciable amount of sulfur.

In Group 3, the wool cuttings and shoddy jute scrap consist of material washed out of raw wool as well as short fibers, and the jute scrap might contain some cattle hair.

In Group 4, the fabric and rubberized fabric is principally rubber coated. The rubber is unvulcanized.

The scrap included in Group 5 is, as you will note, only a very small percentage of the total and probably has little influence on the situation which we are studying at the present time.

If you wish further information concerning any of these items, please let me know.

Very truly yours,

UNITED STATES RUBBER COMPANY

Paul L. Bush  
Director of Laboratory

PLB:mgm

cc: E. G. Bargmeyer

*Thoned him SC 7/1/51*

C- H. L. Voelkert  
L. S. Long

E. A. Luxenberger:

*Why don't you call him*

February 19, 1951

E. A.

FEB 19 1951

An inspection of the dump made today by V. A. Good and the writer reveals that the city is rapidly using up dumping space at our dump location. Further, despite our efforts through the City Fire Department to control fires at the city dump, their side is continually blazing, and as city dumping approaches our dumping ground the probability of a fire will increase alarmingly. Further, at the rate the city is dumping our available dumping space will be consumed within twelve months time. Local trash haulers, and it is possible that some may come from South Bend, are continually dumping at practically all hours of the day and night and at a rate which far exceeds ours.

The condition of our side of the dump was good, but it must be emphasized again that as the city approaches our side we can expect fires since a considerable amount of our material is highly flammable.

We recommend that it should be very definitely pointed out to the city officials that the item which they found to be such a juicy campaign platform in the last election is now their responsibility and should a fire occur the city should be held 100% responsible unless proven otherwise. While some of the trash haulers may live in Mishawaka, a considerable amount of trash that is dumped there comes from South Bend since all trash haulers have routes that carry them through South Bend. Local City Fire Department and Chief Tom Pressler have been very cooperative in whatever they have been able to do. Apparently the caretaker on the city dump must receive his instructions directly from the city hall since they pay no attention to Pressler's recommendations to reduce fire hazards.

F. A. Miller *FAM*

March 22, 1949

The Honorable E. Spencer Walton  
Mayor of Mishawaka  
City Hall  
Mishawaka, Indiana

Dear Mayor Walton:

On March 4 you, the writer, Messrs. Zuidema and Fulton of our New York Engineering Office, Mr. Dodge, and City Controller, Kleiser, discussed incinerators in my office. At that time it was brought out that the City of Mishawaka might seriously consider the installation of an incinerator providing they could make a suitable agreement with the United States Rubber Company.

Based upon this discussion, you were going to visit some communities in the near vicinity for the purpose of looking at municipal incinerators. At the same time our Mr. Zuidema was going to talk to his superiors upon his return to New York and we would then plan to get together or the negotiations could be carried on in writing.

Inasmuch as we are again to be confronted with the nuisance at the dump, we are very anxious to very soon bring this matter to a quick conclusion, and it would be necessary for us to have some sort of assurance from the City of Mishawaka within the next thirty days as to their intentions regarding this matter. I realize, of course, that this cannot be decided by yourself, neither can anything be done until the United States Rubber Company has made a commitment to the City of Mishawaka.

Our reason, of course, for bringing this matter to a quick conclusion is prompted by the fact that we are spending unnecessary money daily and hauling materials to the dump, maintaining the dump, and many other intangibles too numerous to mention.

I would appreciate having a prompt reply as soon as you have been able to discuss this with your official family.

Very truly yours,

H. L. Voelkert  
Plant Engineer

PJG

CC: A. Zuidema - 1230  
E. Luxenberger

EX 4

E. A. Luxenberger  
L. S. Long  
F. A. Miller

PLB 9-1-48  
Laboratory

H. L. Voelkert

Effective at once, the laboratory organization will discontinue all work in connection with the Ball-Band dump. Also, I have notified Professor J. A. Reyniers of the University of Notre Dame that his services as a consultant will not be required at the present time. This change is based on instructions which I received from Mr. Luxenberger this morning.

Professor Reyniers recommended today that we do not add any bleaching powder to the pond at this time because it will tend to kill off the algae growth which has been so helpful this summer in eliminating the release of hydrogen sulfide gas from the pond. These algae will, however, die off later in the year when they finish their cycle. The professor expects that at that time we will have the odor of dead algae and also of hydrogen sulfide.

Professor Reyniers also recommends that further measures be taken to kill mosquito larvae which he noted yesterday were present in the pond in considerable numbers. He also suggests that you may want to fill up the two holes which were dug at his request. These, as you know, were being used by him for trials on control measures to be used on the main pond after the algae finished their life cycle. His work on these, of course, is not finished, but is being terminated today.

P. L. Bush

EX 5

O  
P  
Y

Copy 101. L. C. Long (2)  
D. K. Moore  
Extra (2)  
From: P. L. Bush

To: H. L. Voelkert  
CC: P. L. Bush  
J. C. Slocum  
A. G. Bargmeyer

Subject; Pond at Ball-Band Dump

As a result of our recent survey of the pond at the Ball-Band dump, I wish to submit the following data:

1. Surface area - 207,000 sq. ft.
2. Volume in cu. ft. - 4,222,800.  $\div 27 = 156,400$  cu yards
3. Volume in gallons - 31,586,524
4. Weight of water (based on 62.4 lbs. per cu. ft. and 2000 lbs. per ton)  
131,751 tons.
5. Weight in long tons (based on 36 cu. ft. equals 2240 lbs.) 117,300 long tons.
6. Average depth of water - 20.4 ft.
7. Depth of water at deepest point - 43'.
8. Number of soundings taken - 137

As a point of interest, we calculated the area of the pond according to the map made by Sauerman Brothers, Inc. on April 2, 1948, and found it to be 60,400 sq. ft. less than 1/3 the actual area.

C. E. Ward

at 50 yards per day will take 10 years to fill

EX 6



E. A. Luxenberger  
G. W. Blair  
L. S. Long  
D. A. Moore  
H. L. Voelkert  
Prof. J. A. Rayniers

SGHB 8-18-43  
Laboratory

P. L. Bush

BALL-BAND DUMP

EX 7

The attached report summarizes the analytical results obtained at the dump site during the past three months. In this interim the following steps were taken:

1. About the first of May seven tons of bleaching powder were dumped into the pond, resulting in a tremendous diminution of odor. The  $H_2S$  odor disappeared, but a slight fecal type odor persisted.
2. When  $H_2S$  reappeared in the western end of the pond, an additional ton of chlorinated lime drove it back below the surface.
3. A pump spraying water through a nozzle has been kept operating as much as possible, spraying water over a limited area. The object is to get at least some aeration.
4. An attempt is being made to fill in the north bay region first and to trap all floating debris in that area.
5. Various attempts to perfume the area were only partially successful as the perfume is absorbed by the sand, etc., at the shore.

The following observations were made:

1. Following disappearance of the  $H_2S$  odor algae growth proceeded rapidly. Samples taken 8-11-43 were deep green in color at the surface and at two feet depth.
2. Mosquito larvae are thriving all over the pond. Another type of unidentified larvae also was noted at the north edge of the pond.
3. There seems to have been a slight rise and fall in the level at which  $H_2S$  can be found, although this may not be significant due to insufficient precise data.
4. Judging from *E. coli* counts, the north pond is not being contaminated by the main pond.

Proposed Work

1. Install non-clogging spray nozzles at the pump to improve efficiency of aeration.
2. Trap floating debris in north bay.
3. Make tests on test tubes to determine efficiency of possible additives (e.g. copper).
4. Continue sampling at periodic intervals.

J. C. H. Bargaeyer

ANALYSIS -- BALL-BAND DUMP5-1-48

	<u>H<sub>2</sub>S</u> <u>(Qualitative)</u>	<u>pH</u>	<u>H<sub>2</sub>S</u> <u>(I<sub>2</sub> titration)</u>
North of ramp 20' depth	strong	7.3	16.0
North of ramp 10' depth	"	7.6	16.8
North of ramp surface	V. slight	7.7	14.6
South of ramp 20' depth	strong	7.4	16.2
South of ramp 10' depth	fair	7.3	13.8
South of ramp surface	V. slight	7.7	14.6
South end surface	fair	7.7	15.6
West end surface	strong	7.7	14.8
West end 10' depth	"	7.6	17.0
North Shore (bubbling strongly)	V. slight	7.7	14.4
Pond northeast of main pond	none	7.8	3.6

The iodine titration is not a reliable indication of sulfides or H<sub>2</sub>S. Qualitative tests using sodium nitroprusside in strongly alkaline solution were used to establish H<sub>2</sub>S confirmed by lead acetate test papers.

5-5-48

After dumping a total of seven tons of bleaching powder, the following tests were obtained:

	<u>pH</u>	<u>H<sub>2</sub>S</u> <u>I<sub>2</sub> titration</u>	<u>H<sub>2</sub>S</u> <u>Qualitative</u>	<u>Oxygen</u> <u>Consumed</u>
Center of pond 10' depth	7.7	14.1	strong	98
Center of pond surface	7.9	13.2	"	95
North bay 20' depth	7.8	12.1	medium	108
North bay surface	7.6	12.0	strong	98

Sulfur Analysis  
Samples taken 5-1-48

These samples were analyzed quantitatively to determine H<sub>2</sub>S. One set of samples was oxidized with bromine and the sulfur determined as sulfate. Another set was first boiled to remove hydrogen sulfide and then treated as above.

	<u>Total Sulfur</u>	<u>Sulfur on Boiled Sample</u>	<u>Probable H<sub>2</sub>S</u>
North of ramp 20' depth	50 ppm	33	13
North of ramp 10' depth	51	33	16
West end surface	48	31	17
South of ramp 20' depth	50	32	18

These figures agree well with the iodine titration.

Samples Taken 5-7-48

	<u>pH</u>	<u>Iodine</u>	<u>H<sub>2</sub>S Qualitative</u>	<u>Oxygen Consumed</u>
Ramp, surface	7.8	12.4	strong	-
Ramp, pump nozzle	8.0	9.7	none	92
Southeast corner, surface	7.9	10.4	strong	-
North bay, surface	7.7	13.6	strong	97

Samples Taken 5-8-48

Center, 10' depth	7.9	15.0	very strong	104
North bay, 20' depth	7.3	18.3	" "	108

Samples Taken 5-11-48

North bay 20' depth	-	20.7	-	122
North bay surface	-	14.4	-	89
Center of pond, 10' depth	-	22.2	-	104
Center of pond, surface	-	11.6	-	84

Samples Taken 5-27-48

Ramp, surface	8.0	10.2	-	48
Ramp, 20' depth	7.4	36.0	-	109
West end surface	8.1	8.6	-	32
West end 20' depth	7.7	32.4	-	102
(West end samples in vicinity of pump)				

Samples Taken 6-4-48

Ramp, surface	7.9	7.6	negative	49
Ramp, 2' depth	7.9	11.2	"	56
Ramp, 5' depth	7.7	29.4	medium	107
Ramp, 10' depth	7.6	44.4	strong	130
Ramp, 20' depth	7.1	37.4	very strong	144

Samples Taken 6-10-48

	pH	H <sub>2</sub> S		Oxygen Consumed
		Iodine	Qualitative	
Ramp, surface	9.0	13.6	negative	82
Ramp, 2' depth	8.0	10.3	"	85
Ramp, 3' depth	7.9	12.8	"	88
Ramp, 5' depth	8.0	17.7	"	88
Ramp, 10' depth	7.3	42.2	strong	131
West end surface	7.95	11.4	negative	79
West end 10' depth	7.8	44.3	strong	141

Samples Taken 6-17-48

Ramp, surface	7.8	none	
Ramp, 2' depth	7.9	"	
Ramp, 4' depth	7.6	strong	
Ramp, 6' depth	7.3	"	
Ramp, 10' depth	7.3	"	

Samples Taken 6-24-48

Ramp, surface	8.0	10.8	negative	87
Ramp, 2' depth	8.0	9.5	"	80
Ramp, 5' depth	7.8	28.3	strong	104
Ramp, 10' depth	7.6	38.6	"	123
West end surface	8.0	10.8	low	74
West end 2' depth	8.0	11.9	medium	87
West end 5' depth	7.6	30.6	very strong	103
West end 10' depth	7.6	39.4	very strong	119

Water level - 3" below 0 mark (stick 6' 7" deep in water at south end). One ton of bleaching powder was dumped in the west end.

Samples Taken 7-18-48

Ramp, surface	8.2	12.7	none	674
Ramp, 2' depth	8.1	15.3	"	163
Ramp, 3' depth	7.9	43	present	219
Ramp, 10' depth	7.9	46	"	243
West end, surface	8.2	13.1	none	95
West end, 2' depth	8.1	16.2	"	97
West end, 5' depth	8.0	37.4	present	125
West end, 10' depth	8.0	40.4	present	143

No explanation can be given for the very high oxygen consumed values at the ramp. They may be due to some substance dumped just prior to sampling. Depth of water - 9" below 0 mark.

Samples Taken 8-3-48

	<u>pH</u>	<u>H<sub>2</sub>S</u>		<u>Oxygen Consumed</u>
		<u>Iodine</u>	<u>Qualitative</u>	
Pond #1 surface	-	0.2	none	none
Pond #2 ramp surface	-	9.1	none	94
Pond #3 surface	-	1.6	none	23

Pond #1 (south pond) has fish life and contains oxygen. Pond #2 is the main pond (dump), and pond #3 is the one directly north of the main pond at the north east corner and contains tadpoles. Previous tests showed it to contain oxygen. It also has a copious growth of algae.

Samples Taken 8-11-48

	<u>Color</u>	<u>H<sub>2</sub>S</u>		<u>Oxygen Consumed</u>
		<u>Iodine</u>	<u>Qualitative</u>	
Ramp, surface	greenish	12.9	negative	130
Ramp, 2' depth	green	11.2	"	98
Ramp, 5' depth	milky	40.4	strong	116
Ramp, 10' depth	milky	38.2	"	108
Ramp, 20' depth	greyish dark	56	"	165
West end, surface	green	10.5	negative	106
West end, 2' depth	greenish	10.9	"	79
West end, 5' depth	milky	36.7	strong	92
West end, 10' depth	dark	37.4	"	106
West end, 20' depth	dark	36.6	"	125
Pond #3, surface	clear (faint green)	2.2	negative	6.5

Within the last two weeks a copious growth of mosquito wigglers was found in the pond. Kerosene was ineffective due to the windy conditions existing. EDT in kerosene and paraffin oil at the edge of the pond killed all larvae in stagnant places. A larger batch is being mixed and will be applied around the edges.

Reports from Prof. J. A. Reyniers indicated no B. Coli in ponds #1 and #3, but considerable contamination in pond #2 and the two holes dug north of the pond designated as test tubes 1 and 2.

No H<sub>2</sub>S was found in the test tubes. pH's were 7.3 and 7.1 in the west and east test tubes respectively.

E. G. H. Bargmeyer

J. A. Cunningham  
E. L. Long  
J. G. Brown  
H. L. Tschann  
Bates -

CONFIDENTIAL  
1-10-43

## CONFIDENTIAL - NOT FOR RELEASE

E. L. Long

This report will summarize the analytical data obtained on water from the Harbor Street dump during recent months. Analysis was made (a) before anything was done to the pond, (b) following a period of aeration, and (c) after adding five tons of bleaching powder.

### SUMMARY

1. There was dissolved oxygen showed none present, as was expected.
2. Hydrogen sulfide was primarily responsible for the odor, but other substances, probably manganese, also contribute. Direct analytical tests for the amount of  $H_2S$  present are not very reliable and a better analytical method should be developed, if necessary.
3. The amount of contamination as measured by the "Oxygen Demand" test is extremely high. This test measures the amount of material oxidizable by hot potassiumate solution and probably the best recognized test applicable to the present problem.
4. Aeration for a period of a week appears to have produced a limited effect in reducing total oxidizable material about 3.3%. However, the hydrogen sulfide was not reduced and odor remained as objectionable as before. Much more aeration is needed to reduce the odor in the water.
5. Addition of two tons of 30% bleaching powder (chlorinated lime) was insufficient to eliminate completely from odorous living in the affected area.
6. Five tons of bleaching powder eliminated the hydrogen sulfide odor from the surface but still left a strong type odor which is still objectionable.

### Proposed Work

1. Five more tons of bleaching powder will be added gradually as conditions permit.
2. A survey of the pond area and depth is being made to get a better idea of chemical dosage or treatment required.
3. Direct chlorination is being considered as being cheaper.

### Details

pH values were determined on samples taken 1-10-43, as follows:

(a) Center of pond - surface	3.2
(b) Center of pond 20' depth	7.3
(c) North of ramp surface	7.3
(d) North of ramp 20' depth	7.15

Surface pH values obtained last fall were as follows:

Southeast corner	8.2
North end	8.2
South of ramp	8.2
West end	8.2
Swimming pool	8.2
Pond at northeast corner	8.1

The swimming pool is a gravel pit situated southwest of the dump site and has some fish life.

Mosquito larvae were found on the west end of the dump.

Attempts were made to determine hydrogen sulfide by the method of the American Water Works Association given in "Standard Methods of Water Analysis", 6th edition. However, iodine is too sensitive to all sorts of reducing substances to give a satisfactory determination and a new method is being sought.

The following results were obtained:

	H <sub>2</sub> S in Dump Water, Parts Per Million			
	March 23	April 5	April 15	April 22
Center of pond - surface	-	13.2	-	13.0
Center of pond 20' depth	11.3	14.2	-	15.2
Southeast corner 20' depth	6.8	-	-	-
South of ramp 20' depth	8.0	-	12.8	-
North bay - surface	-	13.0	15.1	-
North bay 20' depth	8.9	14.5	-	13.0
				14.8

In the above determinations, an excess of iodine is added, allowed to stand, and the excess is titrated with thiosulfate. An attempt was made to titrate the samples directly, using an old sample taken approximately two months ago which smelled strongly of H<sub>2</sub>S for comparison. The following results were obtained:

Samples Taken April 22

Center of pond - surface	3.8 parts/million
Center of pond 20' depth	5.1
North of ramp - surface	3.8
North of ramp 20' depth	4.8
Old sample (surface south of ramp)	9.8

Coming from the odor very little hydrogen sulfide was left in the samples after standing overnight in the laboratory. The surface samples seemed to be free from H<sub>2</sub>S at the time of collection.

Presently a direct titration is better although the end point is quite fugitive, due to a large amount of other more slowly oxidizable material.

The March 23rd samples represent the pond before aeration was started.

Aeration was done for several days and a second set of samples taken on April 5.

On April 14 two tons of bleaching powder were dumped into the pond. On April 20th the water was treated with an additional three tons of bleaching powder (30-35% available chlorine.)

### Oxygen Consumed

This determination is used to indicate the degree of contamination of waters. Values obtained on the dump water were extremely high, as shown in the following table:

	<u>Oxygen Consumed</u>		
	<u>March 23</u>	<u>April 5</u>	<u>April 22</u>
Center of pond - surface	-	124	102
Center of pond 20' depth	123	104	93
Southeast corner 20' depth	110	-	-
South of ramp 20' depth	132	-	-
North bay - surface	-	99	76
North bay 20' depth	<u>119</u>	<u>112</u>	<u>107</u>
Average	121	110	96

While there seems to be a trend toward lower values, it should be pointed out that the determination is not reliable in the range of values reported above. These show extreme contamination. However, it does seem likely that aeration helped somewhat, but did not remove the odor. The bleaching powder removed the odor from the surface, but the bottom samples still showed the presence of considerable gas qualitatively.

E. G. H. Bargaoyer



# EXPENDITURES FOR MAINTENANCE OF PUMP FROM SEPTEMBER 1947 TO JULY 30, 1948

BRIEF DESCRIPTION OF WORK TO BE DONE	DATE	JOB.NO.	REQ.	EST. COST	ACTUAL COST OF JOB		
					MAT.	LABOR	TOTAL
Purchase 2 carloads of hydrated lime for pond at dump	10-15-47	41835	2580	1,290.00	1,826.96		1,826.96
Build ramp of dirt at northeast side of pond at dump	10-15-47	41836	2580	727.00	727.14		727.14
Cover ramp at dump and blast the pond with dynamite	11-20-47	41876	2580	191.00	191.52		191.52
Blast ramp at dump and open up around end with crane so water can be played on fire; also furnish 4" pump and 12' boat	3-12-48	71326		18.00	97.86		97.86
	3-9-48	71438		35.00	5.25	39.36	44.61
er ramp at dump and push refuse in pond	4-7-48	71458		393.00	393.14		393.14
Purchase 5 tons bleaching powder and put in dump pond	4-13-48	71485		400.00	522.46		522.46
" " " " " "	4-20-48	71526		450.00	500.59		500.59
Cost of taking analysis of water from dump.	4-30-48	71585		75.00			
Purchase 10 tons of lime & put in pond	6-11-47	73283		400.00	327.67	41.36	369.03
Cleaning charge for July & August	8-6-47	73603		350.00	380.93		380.93
Push rubbish in pond at dump and Level off	10-3-47	73968		289.00	289.34		289.34
Purchase carload of tailing lime for use in dump	10-9-47	74541		140.00	83.60		83.60
Make survey of property used for dump	1-7-48	74880		225.00	225.00		225.00
Furnish gasoline, driver, air compressor and hose at dump	5-12-48	77045		293.00	293.76		293.76
Push debris in pond, haul sand & cover ramp	5-19-48	77085		329.00	328.98		328.98
Push debris in pond at dump	6-8-48	77266		274.00	273.66		273.66
2 holes approx. 10' dia. and 10' deep	8-5-48	77488		* 50.00			
line stakes and rest 2 corner irons	8-10-48	77493		50.00	50.00		50.00
Purchase 48 lbs. D.D.T.	8-14-48	79008		* 18.00			
Purchase 2 type C Circular spray nozzles 3/4"	8-14-48	79009		* 5.00			
Bulldoze and level at dump	8-18-48	79018		* 150.00			
To cover Prof. J. A. Heyneirs consulting service	9-3-48	79113		* 750.00			
				6,982.00	6,517.86	80.72	6,598.58
							973.00
							7,571.58
							total exp. to 9/1/48

EX 8

G. J. Blair  
J. A. Lauenberger  
L. S. Long  
W. C. Slocum  
H. L. Woolkert

SCHE 6-21-48  
Laboratory

P. L. Bush

BALL-BAND DUMP  
CONVENTION WITH PROFESSOR J. A. REYNIERS

June 12, 1948

During an inspection of the dump and pond Saturday morning, June 12, 1948, by Professor Reyniers and the writer the following points were brought out:

1. Algae are growing vigorously in the water and increasing in amount.
2. Hydrogen sulfide is no longer present in the surface water but found at lower depths.
3. The wool waste contributes largely to the fecal odor remaining after hydrogen sulfide has disappeared. Professor Reyniers recommended that this type of waste be disposed of in such a manner that it would not go directly into the pond.
4. The pump is probably not contributing materially to the aeration of the pond. However, its efficiency could be improved a great deal by installing a pipe with a series of spray nozzles giving a finer spray. Non-clogging spray nozzles are said to be available, being in use at sewage disposal plants.
5. If necessary bleaching powder may be used to combat undesirable odors.
6. Professor Reyniers is hesitant about making final recommendations until a study of a complete seasonal cycle has been concluded. The biological characteristics of such ponds vary considerably within short periods. He is hoping that the growth of algae and other organisms will eventually result in a balanced condition, making other (chemical) treatment unnecessary.
7. Larger samples for more detailed examination were requested and furnished Monday morning (June 14). No oxygen was found at the surface, but small amounts must be present to support algae growth. Professor Reyniers reports that algae are present at the surface in large numbers, taper off sharply at two feet, and are very few in number at ten feet depth. Hydrogen sulfide was strong below four feet, but there was none at the surface and a trace at two feet.

Proposed Work

1. Mr. Slocum will try to burn the wool waste to avoid contaminating the pond further.
2. Professor Reyniers will advise as to where the spray nozzles can be obtained.
3. Professor Reyniers is trying to clarify the water to encourage growth of algae. This may be done by alum, or copperas. The latter has given interesting results but needs more study.

E. G. H. Bargmeyer

L. S. Long.  
W. C. Slocum  
E. G. H. Bargmeyer

PLB 5-19-48  
Laboratory

SUBJECT: Floating Rubbish on Ball-Band Dump

H. L. Voelkert

Professor Reyniers has recommended that the condition of the Ball-Band dump could be improved by concentrating the floating rubbish in one location. Mr. Slocum tells me that this has been considered and should be feasible when the wind is in the southeast. The wind would collect this rubbish in the northwest section of the pond and it would be possible to keep it there by stretching a length of hog fence across that portion. Professor Reyniers suggests that after we have this rubbish segregated in one area, we dump any material that would float in this same area, and dump any material which will sink in the balance of the pond.

P. L. Bush

CC: L. S. Long ✓  
E. A. Luxenberger  
F. A. Miller

August 25, 1950

The Honorable E. Spencer Walton  
Mayor of Mishawaka, Indiana  
City Hall  
Mishawaka, Indiana

Dear Mayor Walton:

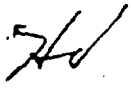
✓  
In company with Mr. V. A. Good and W. C. Slocum I made a survey of the dump site at the Wenger Street location recently. I find that the city is burning considerable materials that are now dumped by them. At the rate the dump is being filled, it is not going to be too much longer until we are going to be confronted with the necessity of acquiring a suitable location for the city dump, as well as a dump for Ball-Sand needs.

Conditions as they existed recently were, in my opinion, quite dangerous as sparks from the burning city dump could have blown over onto our materials which had not all been pushed into the water. This would have set off a very serious conflagration and we would have been severely criticized by residents in the vicinity of the dump. I would request that the city caretaker be issued instructions to be more careful in the future as the possibilities of a serious fire are very prevalent.

It is my opinion that the city of Mishawaka should very seriously consider the installation of a suitable incinerator which would not only take care of the citizens of Mishawaka, but industry as well. You can well realize that if an incinerator is not built in the very near future, that expenses for hauling to a dump, (which would be a greater distance than the present dump), would mean a great deal more to the city, as well as to the Ball-Sand Plant.

I would appreciate very much having your comments as quickly as possible regarding this matter.

Yours very truly,

  
H. L. Voelkert  
Plant Engineer

PG

H. L. Voelkert  
E. G. Bargmeyer  
W. C. Slocum

PLB 5-11-48  
Laboratory

SUBJECT: Ball-Band Dump

L. S. Long

The city is insisting that we control the fire hazard as well as the odor at the Ball-Band dump. This is a reasonable request because a fire there is very disturbing to the surrounding neighborhood, and we certainly do not want any more fires. However, the procedure which we have been following of having Schumacher's equipment and men cover up material along the ramp is a very expensive operation.

Mr. Slocum has suggested that it would be much more economical to station watchmen at the dump on Sundays during the daylight hours, and thus minimize the danger of having people set fire to the scrap material. He points out that the last time Schumachers covered up material, their bill was \$328.00. The previous time, which was a few weeks earlier, the bill was \$390.00. This expenditure of \$718.00 during a period of approximately one month is obviously something which we should avoid. It will be necessary, of course, to have Schumachers bring their equipment to the dump on occasion to level out the ramp and cover the material with dirt. It would certainly seem to be more economical, however, to do as Mr. Slocum recommends, which is to employ watchmen on Sundays and minimize the use of Schumacher's equipment and men.

I recommend that serious consideration be given to the suggestion which Mr. Slocum has made and that we consider making it effective on Sunday, May 16.

P. E. Bush

Mr. G. D. Babcock

December 1, 1947

CC: Mr. J. D. Wolma ✓

The problem of disposing of our waste has always been of importance, but there seems to be so much more of it now that the problem is much more difficult. Mr. Wolma has given this a lot of his time and is trying to see if he can't make some arrangements to find a suitable space for dumping that would take care of our needs for some time to come. He is negotiating presently for the possible purchase of the property south of the tracks containing the old gravel pit.

I don't think a \$35,000 investment in an incinerator is justified at the present time. I think we can meet the situation less expensively; and after all is said and done, the incinerator will put out a lot of smoke and there will be a lot of non-combustible material which cannot be put in the incinerator and which will have to be disposed of.



GEO. W. BLAIR

GWB:MC